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**THE  
ARCHITECTURAL RECORD**

**1934**

**6**

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VOL. 75 NO. 6  
JUNE, 1934

# THE ARCHITECTURAL RECORD

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Davidson, Designer

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Apartment of John Atkinson Dunbar, New York City—William Muschenheim, Architect • Ballroom Foyer and Coatroom, Hotel Astor, New York City—William Muschenheim, Architect • New York Ophthalmic Hospital, 415 East 63rd Street, New York City—Charles H. Lench, Architect • Apartment at 2 Beekman Place, New York City—Eugene Schoen & Sons, Architects • Apartment of William Rosenfield, Chicago, Illinois—Donald Deskey, Designer • Edgewater Beach Apartments, Chicago, Illinois, Suite Designed and Occupied by Mr. and Mrs. A. S. Kirkeby • Remodeled Apartment Interior, Hotel Shoreland, Chicago, Illinois—J. R. Davidson, Designer • Bar and Cocktail Room, Hotel Shoreland, Chicago, Illinois—J. R. Davidson, Designer • Bar Room in the Seneca Hotel, Chicago, Illinois—Louis R. Solomon and Associates, Designers • Granada Café, Chicago, Illinois—Gordon Gundling, Designer • Barnett's Millinery, Chicago, Illinois—Gordon Gundling, Designer • Barnett's Dress Shop, Chicago, Illinois—Gordon Gundling, Designer • Smith Shoe Shop, Chicago, Illinois—Gordon Gundling, Designer • Two Remodeled Elevator Lobbies—Designed by R. M. Karger, Cities Service Company, New York City, 8-10 Bridge Street; 21-24 State Street • House of Mrs. John Erskine, Wilton, Connecticut—Evans, Moore and Woodbridge, Architects • Garage on Estate of Walter S. Brewster, Greenfield Hill, Fairfield, Connecticut—Cameron Clark, Architect; Agnes Selkirk Clark, Landscape Architect

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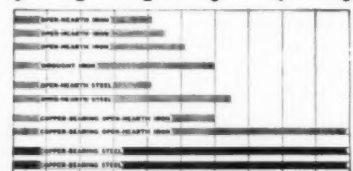
Published monthly by F. W. DODGE CORPORATION, 115-119 West 40th Street, New York. Truman S. Morgan, President; Sanford D. Stockton, Jr., Secretary; Howard J. Barringer, Treasurer. Yearly subscription: United States and Possessions, \$3.00; Canada and Foreign, \$5.00; Single Copy, 50c. Member Audit Bureau of Circulations and Associated Business Papers, Incorporated. Copyright, 1934, by F. W. Dodge Corporation. All rights reserved. Entered as second class matter May 22, 1902, at the Post Office at New York, N. Y., under the Act of March 3, 1879. Printed in U. S. A.

Now buyers of sheets for rust-resistance have scientific information to guide them. The facts, as brought out in the atmospheric-exposure tests made by the American Society for Testing Materials, showed that copper-bearing steel is first in rust-resistance among the entire range of commercial steels and irons. Some of the materials

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**LOW-COST HOUSING AND SLUM CLEARANCE: A Symposium.** *In March 1934 issue of "Law and Contemporary Problems." Published quarterly by Duke University School of Law, Duke Station, Durham, North Carolina. 60 cents.*

**Contents:** A Century of the Housing Problem, Edith Elmer Wood;  
Housing the Poor, Carol Aronovici;  
Urban Housing and Land Use, Herbert U. Nelson;  
The Regional Approach to the Housing Problem, Earle S. Draper and Tracy B. Augur;  
Housing as a Political Problem, Ernest J. Bohn;  
The Drafting of Housing Legislation, Ralph K. Chase;  
Financing Slum Clearance, George W. Warnecke;  
The Relation of Housing to Taxation, Harold S. Bottenheim;  
Housing Projects and City Planning, Alfred Bettman;  
Land Assembly for Housing Developments, Coleman Woodbury;  
Power of the Federal Government to Condemn for Housing, Robert G. Seaks;  
Control of Housing Administration, Walter H. Blucher;  
The Housing Authority and the Housed, Charles S. Ascher.

The Emergency Relief and Construction Act of July, 1932, authorized the Reconstruction Finance Corporation to make 5 per cent, later 4 per cent, loans "to corporations formed wholly for the purpose of providing housing for families of low income or for reconstruction of slum areas." Only one loan was made under this authorization: \$8,075,000 to the Fred F. French Operators, Inc., to reclaim two slum blocks in New York City with 1,600 apartments in two 12-story buildings for white collar tenants, renting at an average of \$12.50 a room a month. The land was valued in the loan agreement at \$14 a square foot.

Perhaps the most important facts brought out by the discussion which arose in connection with projects considered under the Emergency Relief and Construction Act were (1) that land values in metropolitan slum districts are too high to permit new housing to be provided on a self-liquidating basis for the low-income groups now living there and (2) that no substantial progress either in slum clearance or in the provision of low-rent housing could be made until these subjects had been thoroughly analyzed by a competent administrative authority and a policy formulated reconciling apparently conflicting interests.

The National Industrial Recovery Act of June, 1933, in addition to offering self-liquidating loans at 4 per cent to limited dividend housing companies and to public housing authorities made the latter eligible also for 30 per cent grants of the cost of labor and materials; and the formulation of policy was entrusted to the Housing Division of the Public Works Administration.

Under the NIRA up to last March \$48,647,500 had been provisionally allocated in loans to twenty limited dividend housing projects. Rents proposed in these projects run from \$5 to \$11 a room a month, whereas some 78 per cent of the families unhoused by the Knickerbocker Village (Fred F. French) project were paying \$2 to \$6 a room.

Experience under the NIRA has confirmed the conclusion arrived at under the Emergency Relief and Construction Act that tenants cannot be rehoused in metropolitan slums at the rents customary there with the sole aid of self-liquidating loans. If, therefore, any significant success was to be achieved for slum clearance and low-rent housing it would be necessary to exercise the power to make 30 per cent grants. No public housing authority up to May 9 has actually received a grant (and loan). So far Ohio, Michigan, Maryland, New Jersey and New York have enacted state laws enabling housing authorities to be organized, while housing authority bills are pending in Delaware, Illinois, Massachusetts, South Carolina and West Virginia.

The fact that no grants have been made is accounted for partly by the almost total absence until last year of authorities to accept grants—Milwaukee has carried on municipal housing under a state law enacted in 1921—and partly by the hesitation of public sentiment to countenance a social experiment the constitutionality of which has not yet been finally established.

To expedite housing projects, preferably in connection with slum clearance, for tenants whose incomes will not enable them to live in limited dividend homes, the Public Works Emergency Housing Corporation was formed last October. It is up to this agency of the Public Works Administration to defend the constitutionality of the NIRA slum clearance and housing legislation, thus relieving local public housing authorities of the threat of expensive litigation, and to develop experimental demonstration projects. For these purposes the PWA has set aside \$123,670,500.

The importance of the symposium under review lies in the fact that all the contributors have authentic knowledge of the obstacles encountered and the progress



made since the Federal government undertook to promote peace time slum clearance and low-rent housing two years ago.

The present reviewer is one of many laymen who looked upon the slum clearance and low-cost housing program as a major influence toward revival of the building industry. The results of the program as translated into construction contracts have been disappointingly meager. Of the twenty limited dividend projects to which loans have been provisionally allocated seven have been rescinded and only four have reached the construction contract stage up to May 9 in the thirty-seven eastern states (Dodge Reports territory), where the principal low-rent housing demand exists. The four projects are: Woodside, Queens, New York City, \$4,500,000; Hillside, Bronx, New York City, \$5,700,000; Juanita Park, Philadelphia, \$1,045,000, and Neighborhood Gardens, St. Louis, \$650,000—a total of \$11,895,000.

However, the reviewer has obtained a wholly new conception of the slum clearance and low-rent housing problem from this symposium. The general impression obtained is that the problem is far more complex than a superficial knowledge of the literature on the housing movements abroad would lead one to believe and that real progress has been made by the Housing Division in exploring principles, rejecting unsound theories and selecting well-founded methods of approach for experiment. It was the canvass of principles and of practical possibilities by the Housing Division that led to the organization of the Public Works Emergency Housing Corporation, which is to take the initiative in experimental projects, instead of, as the Housing Division was obliged to do, merely act on schemes submitted.

The main conclusions to be drawn from experience up to the present time may be summarized as follows: (1) Good housing may be produced on low-cost land to rent to income groups able to pay, say, \$5 to \$7 a room a month, at the expenditure of a moderate subsidy; (2) slum clearance on a large scale, although planned, has not been successfully carried out anywhere, not even in Great Britain; (3) the provision of new housing for slum dwellers who now pay less than \$5 a room a month implies provision of a more gainful occupation as well as housing—a return in principle to the Garden City idea of Sir Ebenezer Howard. This may be called the regional approach to the housing problem and is being tried out on a broad scale by the Tennessee Valley Authority.

**STATUS OF MUNICIPAL BUILDING CODES.** *Compiled by the Division of Building and Housing, Bureau of Standards, Department of Commerce, Washington, D. C. Letter Circular LC-377, May 19, 1933. Free.*

The information presented in this small mimeographed publication is of special interest in view of the discussion of municipal building regulations in this issue of *THE RECORD*. The data are based on answers to questionnaires sent in February, 1933, to municipalities having a population of 2,500 or more. The tabulation, however, is based on those having a population of 5,000 or more.

A summary of the replies shows that 108 cities have building codes 20 years old or over; 137 have codes 15 to 20 years old; 216 have codes 10 to 15 years old; 420 have codes 5 to 10 years old; and 296 have codes less than 5 years old. In addition, 453 cities report that they have no building code; this fact, however, does not necessarily mean that building is unrestricted, since state laws apply in a number of instances. The tabulation also shows which municipalities are revising their codes, and where revisions are recent the nature of the principal changes.

**SOME CODE CONTROLS OF SCHOOL BUILDING CONSTRUCTION IN AMERICAN CITIES.** *By John W. Sahlstrom, Ph.D. Teachers College, Columbia University Contributions to Education, No. 581. Bureau of Publications, Teachers College, New York City. 153 pages. \$1.50.*

The problem of investigating the effects of municipal building codes on the construction of codes suggested itself when the author of this study was working with Professors George D. Strayer and N. L. Engelhardt of Teachers College in reviewing proposed plans for school buildings.

One hundred building codes from cities of various sizes in various geographical sections were selected for study. In a comparison between state and local school building regulations, it is significant that the first prescribe for the safe construction, educational fitness and sometimes the economical planning of schools, whereas the latter are limited to considerations of safety. Generally, compliance must be made with both the local and state codes, with the result that there is coming to be more and more duplication of function. From the standpoint of efficiency, economy and safety, Mr. Sahlstrom recommends the lodging of complete control "in that instrument which is not hampered by the limitations of the police power, which may command the services of competent specialists in both the educational and technical phases of construction, and which has at its disposal the facilities for administration, revision and research." The report of this investigation analyzes in detail the status of the schoolhouse in code classification, the requirements for fire resistance, and for stairways, fire escapes, bearing walls, live floor loads, and sanitation.

## CALENDAR OF EXHIBITIONS AND EVENTS

June 1	Opening of the World's Fair of 1934 at Chicago.
June 15	Closing date for entries of post office lobby design. Address, Carl P. Dumbolton, Architectural Director, Quarry Tile Industry, 600 Investment Building, Washington, D. C.
June 19-22	Semi-annual meeting of the American Society of Heating and Ventilating Engineers at the Inn, Buck Hill Falls, Pennsylvania.
July 1	Closing date for entries, Small House Competition. Address, House Competition Editor, House Beautiful—Home & Field Magazine, 572 Madison Avenue, New York City.
December 3-8	Eleventh National Power Exposition, at Grand Central Palace, New York City.

J. and G. Daverman and Chris Steketee, architects, announce the removal of their offices to 40-42-44 Porter Block, Grand Rapids, Michigan.

Abraham H. Okun, architect and engineer, has removed his office from 51 Liberty Street to 79 High Street, Monticello, N. Y.

The Art Commission of the City of Los Angeles announces an exhibition of charcoal drawings of the Civic Center of Los Angeles, by John W. Wardman, during June in room 351, City Hall.

The New School of Social Research in New York City announces a course in architectural design under the direction of W. K. Harrison, with criticisms on Tuesdays and Fridays from 3 to 6 o'clock, commencing November 3. Previous training in architectural or mechanical drawing is required.

A course leading to a bachelor's degree in city planning is now offered by the School of Architecture at Massachusetts Institute of Technology.

The Cranbrook Academy of Art announces that the fourth year of its post-graduate architectural department, under the direction of Eliel Saarinen, will begin in the fall. Courses in advanced sculpture will be given by Carl Milles, and in advanced printing by Zoltan Sepesky.

## ARCHITECTS' ANNOUNCEMENTS

Ragner Ostberg, Swedish architect, gave an illustrated lecture at the Metropolitan Museum of Art in New York City on May 25 through the courtesy of the American Institute of Architects and under the auspices of New York University.

The architects of Western Massachusetts have formed an organization under the name of "The Architectural Society of Western Massachusetts." Twenty architects are members of the newly formed Society. The officers for the coming year: Harry M. Seabury, President; Frank W. S. King, Vice President; Henry J. Tessier, Secretary-Treasurer; Max H. Westhoff, Morris W. Maloney, and Robert B. Warner, Board of Governors; Edward H. McClintock, temporary representative to the Construction Code Council.

The object of the organization as given in the by-laws is: To organize and unite in friendship the architects of Western Massachusetts, and to promote efficiency and maintain the standards of the profession.

The Federation of Architects, Engineers, Chemists and Technicians, a national organization of professional workers with headquarters at 10 West 47th Street, New York City, has recently consolidated its activities in a three-fold program involving immediate employment, a program of public works and unemployment insurance.

On the first point the Federation has been successful, through its employment committees, in placing men on PWA and CWA jobs and on municipal projects. The grievance committees have been able, in many cases, to win better wages and conditions on these jobs and to get many individuals reinstated after they were dropped from the projects during the demobilization of the CWA.

On May 15 the Federation announced a provisional formulation of a public works program. One of the main points in this program calls for the establishment of a comprehensive national key-plan under which public works projects will be developed. This program is to be of both immediate and long-time character.

In order to win support for its public works program, Federation chapters all over the country are organizing speakers' bureaus for the purpose of supplying competent speakers to cooperating organizations. Research bureaus are also being formed to provide technical information on the various subjects involved.

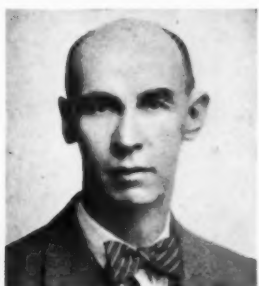
A number of bills for unemployment insurance are now before Congress. The Federation, after careful consideration, has officially endorsed HR 7598, the Workers' Unemployment Insurance Bill.

The national organization now comprises almost 9,000 dues-paying members, of whom more than 4,000 are architects.

# IN THIS ISSUE



WILLIAM  
LYNCH  
MURRAY



DR. P. G.  
AGNEW



PAUL W.  
KEARNEY



REALTO E. CHERNE  
and  
CHESTER L. NELSON

## CONTRIBUTORS TO THIS ISSUE

WILLIAM LYNCH MURRAY . . .

author of the article, "Revise Building Codes Now" (pages 480-486), is a registered architect in Harrisburg, Pennsylvania.

DR. P. G. AGNEW . . .

secretary of the American Standards Association, describes its building code program (pages 488-494). In 1906 Dr. Agnew joined the staff of the Bureau of Standards; in 1908 he was appointed physicist and headed numerous research projects on electrical measurements, transformers, and the like. In 1918 he became secretary of the American Engineering Standards Committee, which later became the American Standards Association. He is also secretary of the Electrical Standards Committee and Secretary of the United States National Committee of the International Electrotechnical Commission.

PAUL W. KEARNEY . . .

free-lance journalist and author of "Fire Control" (pages 495-502), has been writing about fires almost exclusively following a chance interview with Chief Dougherty, dean of the New York Fire College. He is co-author with Chief Dougherty of "Fire," author of a juvenile book, "Dan, the Young Fireman," and has contributed fire articles to the Saturday Evening Post, Ladies Home Journal, Woman's Home Companion, and some 40 other periodicals. At present he works in close conjunction with the National Board of Fire Underwriters and the National Fire Protection Association, preparing special reports for the latter on important conflagrations in the New York area. He has also written a book on games of solitaire.

REALTO E. CHERNE AND CHESTER L. NELSON . . .

co-authors of the Technical News and Research article, "Preliminary Planning for Air Conditioning" (pages 536-548), are both graduates of the College of Engineering, University of Minnesota. At present both are engaged in engineering work with the Carrier Engineering Corporation. Each has written articles for Heating, Piping and Air Conditioning and other publications in the ventilation engineering field. Mr. Cherne assisted in the preparation of the 1934 Guide of the American Society of Heating and Ventilating Engineers.

## NEXT MONTH:

Portfolio of SPECIAL BUILDING TYPES including a brewery, two hospitals, a funeral home, a shopping center, a country club, a beauty parlor, an ice dispersing plant, a newsstand.

HOUSING OBSOLESCENCE by Thomas S. Holden.

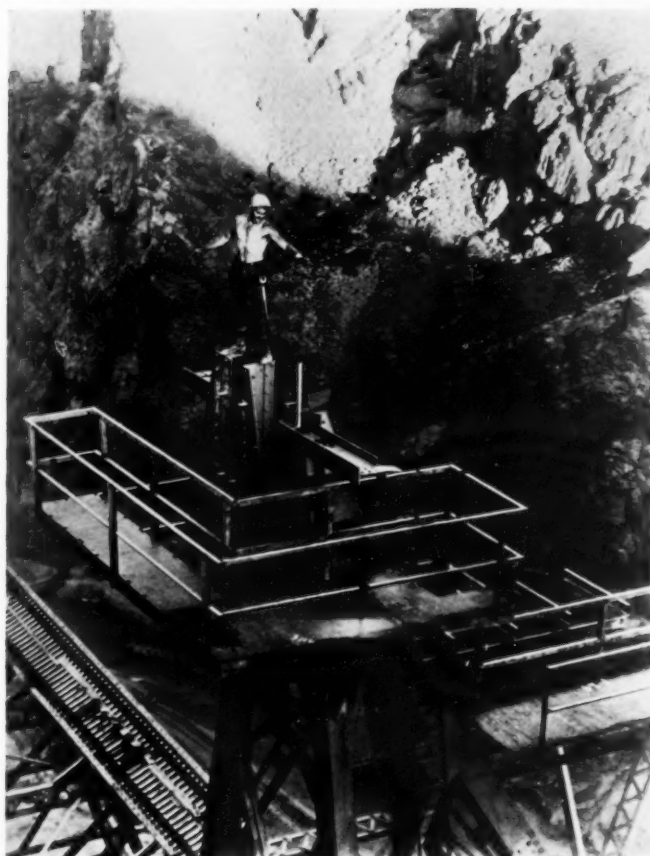
ELECTRICITY IN THE HOME, Part Two, by Henry L. Logan, consulting engineer.



## ILLUSTRATED NEWS

### BOULDER DAM

A steel worker atop cableway tower on the Nevada rim of Black Canyon above Boulder dam site. The Public Works Administration allotted \$38,000,000 to the Bureau of Reclamation to continue work on the Boulder Canyon project.



### PROMETHEUS WITH ZODIAC

The Prometheus Fountain in the Sunken Plaza in Rockefeller Center, New York City, has just been completed. Designed by Paul Manship, American sculptor, the bronze fountain group depicts Prometheus, legendary contributor of fire, bearing the gift down to mankind. Prometheus, the central figure, is two and one-half times life size. The two basins of the fountain are of polished Deer Island granite and the back wall is of red Balmoral granite. Water spills over the lip of the upper basin into the lower basin which is sixty feet wide and sixteen feet across. The fountain is centered against the west wall of the Sunken Plaza in the middle block of the development between 49th and 50th streets. It will be illuminated with floodlights at night and visible at all times from Fifth Avenue.



*Samuel H. Gottscho*



## AUTOMATIC DOORS IN PENNSYLVANIA STATION

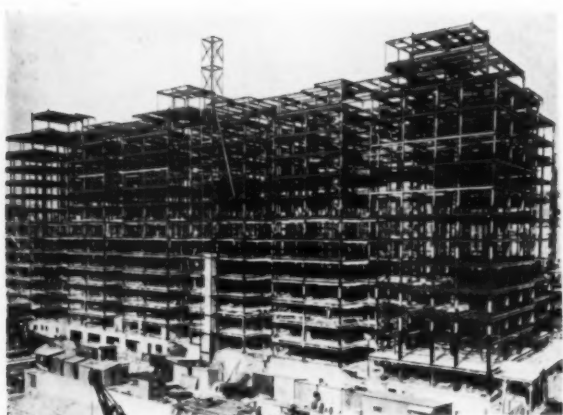
A photoelectric cell mechanism actuates the new doors in the Pennsylvania Station, New York City, installed by specification of McKim, Meade and White, architects. The doors have plywood centers covered with red Formica refinishing stock veneer, inlaid with black lines.



*Anderson*

## A NEW STEEL HOUSE

The first operating subsidiary of Universal Houses, Inc., has been organized recently in Kansas City, Missouri. This local company is now engaged in erecting Universal type non-standardized steel houses, following a method of construction evolved by John H. Miner, structural steel engineer. Standard parts consist of door, window, corner, and plain panels; roof trusses; floor beams; and all other items for the erection of completed houses, assembled on the foundation like an over-sized Erector toy, by trained erection crews of six men each.



*Ewing Galloway*

## KNICKERBOCKER VILLAGE

The east unit of the first building of the Knickerbocker Village, New York City, nears completion. The \$6,000,000 Fred F. French building project, which will house 1600 families in 6000 rooms, is scheduled to be ready November 1. The two 15-story units will have 13,200,000 cubic feet of building space and 1,300,000 square feet of floor space.



*Wright*

## TUBES FOR AIR MAIL

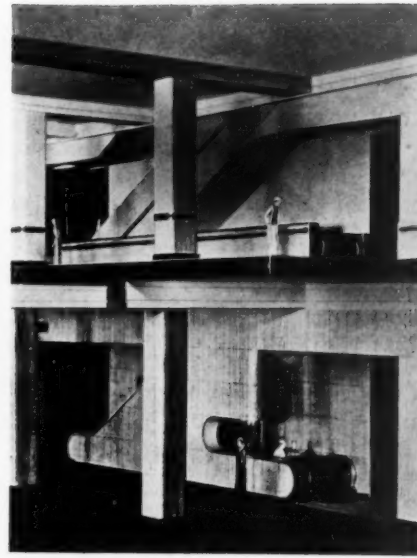
In the New York General Post Office a high-speed underground mail tube system shoots some 6,000,000 letters daily to all parts of the city. It is this type of service that will be a part of a new scheme enabling air mail planes to shoot their mail to the post office destination five minutes after a plane has landed.



The District of Columbia war memorial in Potomac Park has been chosen by the architectural committee of the Washington Board of Trade as the most outstanding memorial erected in the national capital in the last two years. The memorial, of white Vermont marble, is a Greek Doric temple large enough to accommodate an eighty-piece band. It was designed by F. H. Brooke, architect, with Horace W. Peaslee and Nathan Wyeth, consultants.



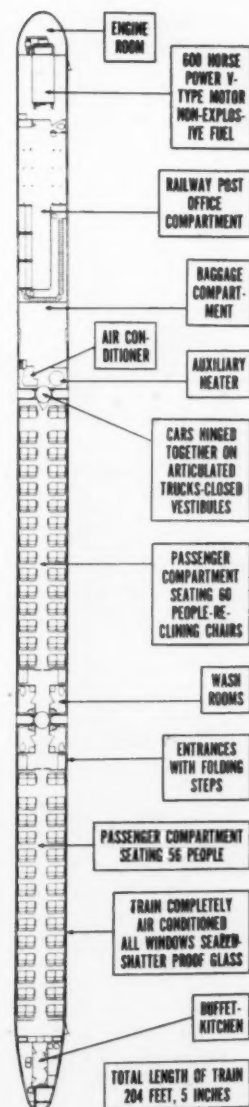
The 100th anniversary of the erection of Manning Hall was recognized at Brown University in appropriate exercises as a part of the Visiting Day Program. Manning Hall, named in honor of James Manning, the first President of Brown University, was the third building to be erected on the campus of the University. It is an example of the Greek revival which influenced American architecture during the first fifty years of the 19th century.



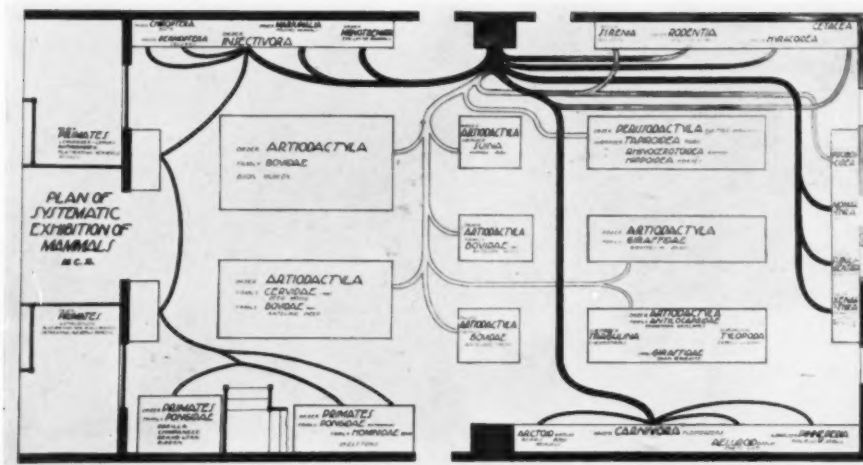
Model of the new Otis "streamline" escalators—an exhibit at the Industrial Arts Exposition, New York City.

## STREAMLINED...

The three cars of the new streamlined Union Pacific passenger train, built of aluminum alloy, weigh only as much together as a single Pullman sleeping car. With its 600-horse power internal combustion engine directly connected to an electric generator, this super-speed train is capable of a maximum of 110 miles an hour.







## FLOOR MOSAIC MAMMAL DIAGRAM

The exhibition hall floor mosaic, shown at left, is based on the classroom chart, shown below

The Harvard Museum of Comparative Zoology has made an educational innovation in its systematized mammal exhibits by projecting on the floor of the hall colored lines showing the inter-relationship of all the important orders in the mammalian kingdom from Man down to the egg-laying Duck-bill Platypus. This relationship can best be illustrated for educational purposes by means of a diagrammatic tree. On the wall of the Museum hall is a chart showing a tree with varying colored branches. The trunk of the tree represents the Mammalian Phylum; the larger branches the zoological orders which may be divided into smaller branches or sub-orders, and these in turn into even smaller and more compact groups called families.

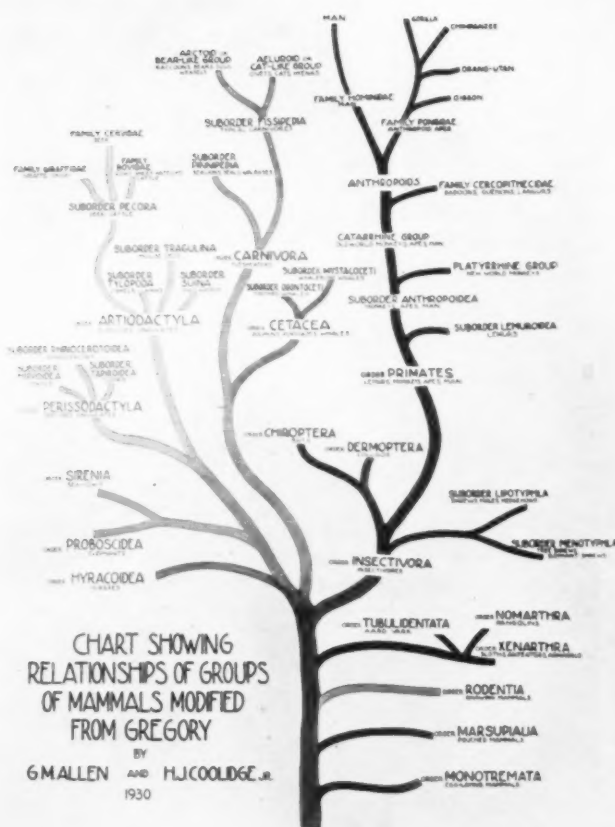
Because of the shape of the exhibition cases and the size of animals like the giraffe, it has proved impossible to arrange them so that each would occupy the correct position if the tree of mammalian relationship were projected without distortion on the floor of the room. The mammalian family tree most universally accepted by scientists at the present time, however, has been projected in colored lines on the floor. The colors are in every case the same as those in the tree chart on the wall and the main limbs spring from the same root or central stem. In this way it is a simple matter to follow the blue line on the floor to see who Man's closest cousins may be, or the yellow line that leads from the rodent case if one wishes to trace the relationship of the beaver found there with the other groups of mammals.

In many systematic museum exhibits, especially in Lenin-grad and Moscow, wall lines and charts are used but a reflection of such a wall chart with the same colors painted on the floor and leading to the mounted animals with their complete descriptive labels has probably not been used before in a mammalian exhibition.

The distortion of the chart because of existing space conditions raises the question whether the museum hall should be designed to agree with the chart. According to H. J. Coolidge, Jr., of the Museum of Comparative Zoology, "This is a problem which would be difficult to solve because every few years scientists change their views about animal relationships. This does not, however, usually apply to the more important groups; but some revolutionary find among the fossils may cause such a change and then what would the architect do unless his cases were on little rollers and could be moved about?"

## GOLD MEDAL AWARD

For the design of the Radcliffe College Lecture Hall in Cambridge, Massachusetts, the firm of Perry, Shaw and Hepburn has been awarded the Harleston Parker Gold Medal of the Boston Society of Architects. The building was first published in *The Architectural Record* in October 1931.





NIGHT VIEW—RENDERING BY HUGH FERRISS

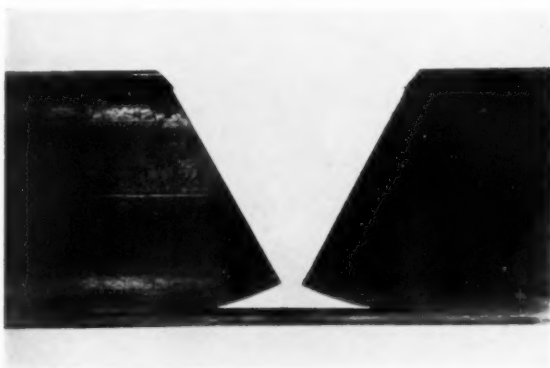


FIGURE 1

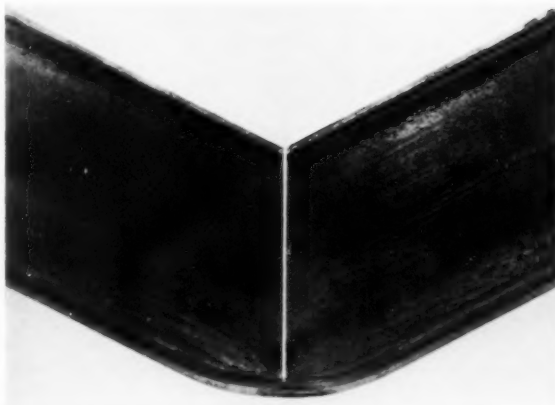


FIGURE 2



FIGURE 3

## WELDING IN THE FORD BUILDING AT THE 1934 CENTURY OF PROGRESS

The Ford Exposition Building has been designed by Albert Kahn, Inc., for the World's Fair in Chicago. The building proper is nine hundred feet long with a central rotunda one hundred and ten feet high. The small wing of the building at left (south) will house Mr. Henry Ford's personal historical exhibit. The large rotunda will display the Drama of Transportation, an exhibit of vehicles ranging from the early Egyptian Chariot to the modern automobile. The long wing on the right (north) will house the industrial exhibits of the Ford Motor Company and a group of its principal supplies.

From a standpoint of structural design, the roof framing over the three monitor bays of the north wing of the building is of particular interest. In place of the usual monitor trusses, a continuous I-beam is cut, bent and welded in shape. Fig. 1 shows how the beams were cut with a triangular notch and the desired radius for the bottom flange; Fig. 2 shows the beam bent into position; Fig. 3 shows the bottom bend reinforced with a strut on each side of the web and the welding completed. Through the employment of these continuous beam monitor frames, fabricated by the R. C. Mahon Company, Detroit, the usual maze of steelwork is eliminated, giving the appearance of a much higher ceiling.



Kaufmann-Fabry



American Museum of Natural History



Alexander Piaget

A Hugh Ferriss rendering of the proposed Hayden Planetarium in New York City. Trowbridge and Livingston are the architects.

The new Municipal Auditorium in St. Louis was formally dedicated with a program of activities during April 14-28. The building faces north and commands a view of the entire Memorial Plaza. The Auditorium's overall dimensions are 320 feet from east to west and 500 feet from north to south. Its height is 168 feet from the street to the ridge line of the main arena. Exterior walls are faced with Bedford stone in harmony with the monumental character of the design and in harmony with the present Municipal Courts Building, the new Civil Courthouse and other Memorial Plaza buildings. The architects are La Beume and Klein.

#### FAMOUS TEMPLE IN ATHENS TO BE REBUILT

The little temple of Nike on the Acropolis is in danger of caving in. Architects, investigating the foundations, reported the weakness of the structure. As a result of the report, arrangements are now being made to take down the temple and rebuild the base on which it stands. The temple will then be set up again on the new, firm foundation. The project is expected to require a year. Temporary removal of the building is welcomed by archaeologists, who see a chance to learn whether a still more ancient structure stood on the site of the Temple of Victory. The Nike temple was built about 410 B.C. and stood until 1687, when it was damaged in the bombardment of Athens by the Venetians. The Turks at that time took the temple materials to use in building a bastion. About a century ago, German and Greek architects attempted to restore the temple to its original delicate beauty, but lack of experience in this type of problem resulted in a reconstruction lacking in permanence. Storms or even slight earthquakes threaten the edifice.

#### SOCIETY OF CHEMICAL INDUSTRY

The system which supplies the islands of Bermuda with fresh water was the subject of discussion at a meeting of the American Section of the Society of Chemical Industry, held jointly with the American Chemical Society, the Electrochemical Society and the Societe de Chimie Industrielle May 5 in New York City. Dr. W. D. Turner, of Columbia University, who developed the system, presented a paper entitled "The Bermuda Water Works," in which he described the special installation made necessary by the soil conditions peculiar to the islands. On a visit to the islands he conceived the idea of applying horizontal wells or infiltration galleries for collecting the surface waters. The system produced water free from salt but very hard, due to percolation through the coral sandstone. This system was therefore supplemented by an extensive softening process, and the resultant soft, fresh, pure water is now being produced and distributed throughout the colony in a complete system of asbestos water mains designed to be resistant to the serious corrosion conditions existing in these sub-tropical sea islands.

#### ARCHITECTS PROTEST CHEAP BUILDINGS

Use of cheap materials in Federal buildings is opposed by the American Institute of Architects and the Producers' Council, a national organization of manufacturers. A resolution adopted by both organizations and sent to President Roosevelt protests against "a trend in the planning of building to cheapen construction below the requirements of wise economy in quality of construction and materials." This policy would result in unnecessary increase in maintenance costs, thereby adding a correspondingly heavier burden upon the taxpayers and business, it is charged.

"It is desirable that the investment of public funds should be safeguarded by insisting upon adequate standards in construction methods and materials, which is recognized as a fundamental policy in the financing of non-Federal buildings," the resolution says.

"The American Institute of Architects and the Producers' Council urge the Federal Government to maintain a policy in the planning and erection of Federal buildings which will not require a reduction in unit cost so drastic that suitable standards cannot be maintained which are consistent with sound principles of investment and conducive to appreciation of good architecture and to community pride.

"The Institute and the Council do not advocate extravagance in building, but believe that Federal buildings should be planned with a view to combining utility, minimum maintenance expense, and good construction, which will make them a sound investment, and worthy examples of good architecture, symbolizing the dignity and stability of the Federal Government wherever they may be erected and regardless of their size."

#### PRIX DE ROME AWARD

Robert A. Weppner, Jr., twenty-seven-year-old instructor in architecture at the Catholic University in Washington, has been awarded the Rome Prize for Architecture, at the conclusion of the annual competition sponsored by the American Academy in Rome.

A native of Lakewood, Ohio, Mr. Weppner began his college career at Notre Dame University, where he remained a year, and

was graduated from the Catholic University, in Washington, with the degree of bachelor of science in architecture. In Washington he became later associated with the firm of Murphy & Olmstead. He also worked with the firm of Waddy B. Wood.

The competition problem was a memorial in Washington to the Founders of the Republic, specifying a location at the end of a main park vista near the Potomac River in conformity with the general plan for the future development of the capital.

#### PRIVATE ARCHITECTS TO DESIGN FEDERAL BUILDINGS OVER \$60,000

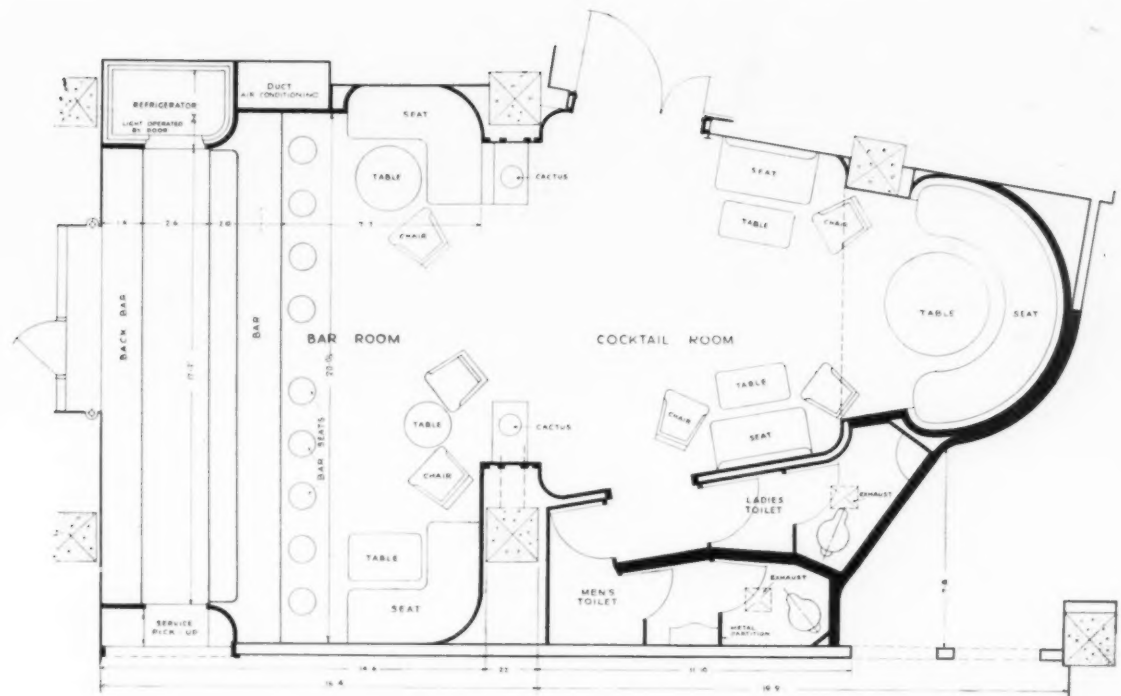
Private architects will design Federal buildings costing more than \$60,000, according to an announcement by the American Institute of Architects following a conference of Institute representatives with officials of the Treasury Department. Structures in the smaller communities involving less than this amount will be planned by government architects.

Louis La Beume of St. Louis, chairman of the Institute's Committee on Public Works, declared in a progress report that the long struggle of the Institute to win recognition for outside architects has resulted in the adoption of a new general policy favorable to the architectural profession. Appointments of architects for certain projects under the Federal building program are expected soon.

"The representatives of the Institute heartily endorsed the Government's policies with regard to simplification of design and economies of construction," the report said. "They reaffirmed, however, the obligation of the Government in the encouragement of good architecture, however simple or however practical the proposed projects might be."

Treasury officials will submit an outline of proposals regarding fees, standards of architectural types, and other matters for the Institute to study, it was decided at a conference between Rear Admiral C. J. Peoples, Director of the new Federal Procurement Division, W. E. Reynolds, assistant director, L. A. Simon, supervising architect, and Frank C. Baldwin, secretary of the American Institute of Architects, E. C. Kemper, executive secretary of the Institute, and Mr. La Beume.



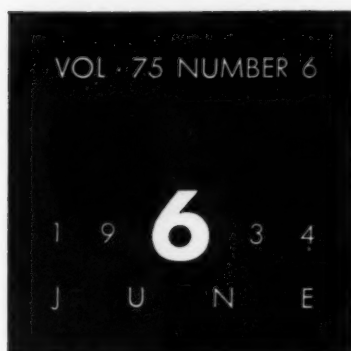


PLAN OF BAR AND COCKTAIL ROOM IN HOTEL SHORELAND  
CHICAGO - - - - - J. R. DAVIDSON, DESIGNER

FOR ILLUSTRATIONS OF THIS MODERNIZATION PROJECT, SEE FRONTISPIECE (FOLLOWING PAGE)  
AND ALSO PORTFOLIO PAGES 517-519. PHOTOGRAPHS BY HEDRICH-BLESSING.

**IN THIS ISSUE:**  
BUILDING CODES  
MODERNIZATION  
AIR CONDITIONING





# **T H E ARCHITECTURAL RECORD**

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## A FOUR POINT PLAN FOR BUILDING TRADES RECOVERY

A national housing program was started on May 14 when President Roosevelt sent a message to Congress, proposing four major interrelated activities:

- (1) MODERNIZATION, REPAIR AND NEW CONSTRUCTION.
- (2) MORTGAGE INSURANCE.
- (3) MORTGAGE ASSOCIATIONS.
- (4) INSURANCE OF BUILDING AND LOAN ASSOCIATIONS.

Following the reading of the message identical bills carrying out the proposed plan were introduced in the House and Senate.

At the same time Frank C. Walker, Executive Director of the National Emergency Council, made public supplemental information concerning the problem that is dealt with in the housing program which the Council recommended to the President and on which the legislation was asked.



**A**fter stating the extent of the decline in construction—from a former annual aggregate of \$11,000 million to a present annual total of \$3,000 million, and from a former annual residential construction of \$3,000 million to a present annual total of \$300 million—Mr. Walker's report continues:

*Besides being accountable at the present time for our largest industrial problem and our largest unemployment relief problem, the construction industry is also accountable for our largest remaining financial problem. The real estate mortgage debt in the country as a whole is \$43,000,000,000. This is the largest single class of outstanding long-term indebtedness in the capital market. It is more than three times as large as the total railroad debt, four times as large as the total public utility long-term debt, and four times as large as the total industrial long-term debt. It is nearly as large as the combined totals of national, state, county, and municipal debt.*

*Of this mortgage indebtedness, \$21,000,000,000 or approximately half the total, is represented by individual mortgages on homes. Much of this huge home-mortgage debt, furthermore, was created under the unsound financial practices that prevailed during the boom conditions of 1922-29. Those unsound practices are now universally recognized and discredited. The most detrimental of them were the following:*

*The practice of financing new construction through the use of second mortgage financing at exorbitant costs.*

*The practice of charging excessive fees, in addition to high interest rates, for the renewal of maturing mortgages.*

*The practice of making long-term loans on a fictitious short-term basis. That is to say, mortgages were written on a three-year or five-year basis, but without any provision for their gradual repayment out of the income of the borrower; and they were expected as a matter of course, by borrower and lender alike, to be renewed or refinanced at maturity.*

*Owing largely to these unsound practices of the years 1922-29, the mortgage market has been unable to stand the strain of the depression or to share in the general recovery. In many sections of the country, active mortgage financing has virtually disappeared. New residential construction, even where it is fully justified, has from almost the beginning of the depression been drastically curtailed because of the inability of borrowers to obtain second-mortgage financing. It has also been difficult for borrowers to obtain the customary renewal or refinancing of maturing mortgages; and they have in numerous instances been pressed for heavy repayments at the time when they were least able to make them.*

*By 1933, when the Home Owners' Loan Act was enacted, it was estimated that 10% of all mortgaged urban homes had been foreclosed. Foreclosures were going forward, furthermore, at the rate of nearly 25,000 homes per month. Since then the foreclosure rate has declined to about 20,000 homes per month. To date the Home Owners' Loan Corporation has received 1,250,000 applications aggregating more than \$4,000,000,000.*

*These facts make it plain that the reorganization and reopening of the mortgage market is as vital to the free functioning of our financial institutions as is the resumption of construction to the reemployment of the huge army of workers that is now being carried on the relief roll. We have here, in fact, a sort of vicious circle. Unemployment is maintained at a high figure because of the absence of facilities for financing new construction, while at the same time the financial burden of the existing mortgage debt becomes increasingly difficult to carry because of the continuing large volume of unemployment.*

In the program recommended to the President by the National Emergency Council, the mortgage problem is attacked by four different methods, all essential parts of an integrated whole. Together they are intended to encourage, in areas where new construction is economically justified and where an economic demand is present, a resumption of building activity but under new and sound financial practices.

Quoting the NEC report the four component parts of the program are:

## FOUR METHODS

## TO SOLVE

## THE PROBLEM

- (1) **MODERNIZATION.** *After five years of neglect of the ordinary maintenance of our residential, commercial, and industrial properties, a widespread potential demand now exists for construction in the field of repair, renovation, and modernization. By providing definite incentives in the way of reasonable costs and advantageous credit terms, we can stimulate a renewal of activity and employment in the kind of construction, both urban and rural, in which substantial results can be most quickly obtained. A modernization campaign and a plan of home-improvement credit have been proposed as a means of inducing the prompt undertaking of this work. The modernization project would embrace commercial and industrial property as well as residential property. The special credits that have been proposed, however, would be limited to a maximum of \$2,000 each, and hence would be availed of for the most part by homeowners.*
- (2) **MORTGAGE INSURANCE.** *A plan of mutual mortgage insurance, under governmental direction, has been proposed as one of three principal means of reopening the mortgage market. By insuring mortgages on existing homes up to 60 per cent of their currently appraised value, we can induce private capital again to invest more freely in mortgages. By offering to insure mortgages on newly completed homes, but up to 80 per cent of the appraised value, we can enable new construction to go forward without any occasion for reviving the second-mortgage market. Mortgages would be insured, however, only where the insurance would be beneficial to the mortgage market. No construction of a speculative type would be eligible to mortgage insurance, nor would the insurance be granted in areas where there was an existing surplus of modern homes. New construction, therefore, would be limited to that which is economically justified in each community. In other words, new construction would for the immediate future be localized. Then as the modernization campaign got under way, and the general recovery program became further advanced, the justifiable demand for new construction would spread in an ever-widening circle.*
- (3) **MORTGAGE ASSOCIATIONS.** *As another important means of reopening the mortgage market, the authorization of privately owned and operated mortgage associations, to be incorporated under Federal charter, has been proposed. By placing these associations under rigid Federal supervision, and restricting their dealings to the insured mortgages, we can provide an effective means of attracting funds from financial centers in which there is a surplus of capital for investment to areas in which local savings are insufficient to meet the requirements of home financing, and in which the local cost of such financing is therefore unduly high. In this manner the advantages of low-cost, long-term financing can be spread to communities throughout the country.*
- (4) **INSURANCE OF BUILDING AND LOAN ASSOCIATIONS.** *The insurance of the shares and certificates of sound building and loan associations has been proposed as still another important means of reopening the mortgage market. These institutions have been placed at an inequitable disadvantage since the insurance of bank deposits was put into effect at the beginning of the present year. By insuring building and loan savings, we can remove this disadvantage and again enable the associations to attract small savings for mortgage lending.*

# FIRST TWO MONTHS UNDER THE

**T**HE CODE OF FAIR COMPETITION FOR THE CONSTRUCTION INDUSTRY WENT INTO EFFECT ON MARCH 2. THE CONTRACTS SO FAR LET UNDER IT ARE OF COURSE TOO FEW IN NUMBER AND TOO LIMITED IN VARIETY TO SUPPLY A BODY OF EXPERIENCE UPON WHICH TO FORM DEFINITE OPINIONS AS TO ADVANTAGES AND DISADVANTAGES OF THE CODE. HOWEVER, IT SHOULD BE OF INTEREST TO LEARN WHAT IMPRESSION HAS BEEN MADE UPON ONE OR TWO REPRESENTATIVES OF THE INDUSTRY IN EACH OF A DOZEN CITIES BY THE FIRST TWO MONTHS OF CODE ENFORCEMENT.

**JOHN H. COWPERTHWAIT**  
J. Sims Wilson and Company  
Contractors and builders, Philadelphia

*So far the Code has had the effect of greatly increasing prices of work in our line and, as far as we can judge from our own experience, curtailed the progress of contemplated work.*

*The advantages in theory may be all right, but since the depression our old clients, who practically make all their improvements from the income derived from their investments, have been obliged to curtail because of the returns which they are now receiving and the uncertainty of the future.*

*Again, the Code has made the individual mechanic, who has been temporarily laid off, enter the market as a free lance, with the owner purchasing all required material, while he furnishes labor alone. With prices arranged as per Code the individual can purchase all his requirements at exactly the same price as we would have to pay our material men, so you can readily see that it would be a physical impossibility for us to compete along this line.*

**EDWARD P. FLANNERY**  
John N. Gill Construction Co.  
Philadelphia

*In our opinion the Code will affect building costs only in so far as they have been driven too low under the effect of unrestrained and irresponsible competition.*

*Prices will undoubtedly be increased, but it is probable that this increase will only be the amount that prices have fallen below actual cost of production. There does not seem to be any danger that the Code will afford any opportunity to increase prices beyond this point until the volume of work rises to somewhat near parity with the capacity of the construction industry.*

*We do not see any real disadvantage in the Code requirements, except the necessity of learning to operate under the Code; the advantage is very definite in that the Code, if enforced, will insure fair wages, which have always been paid by good construction firms with a competitive advantage to the firms that did not pay fair wages; the various devices that have been used in purchasing to drive prices below cost, or fair costs, are prohibited and with any reasonable degree of enforcement can be prevented.*

*One essential is the appointment of the proper persons to the various committees in authority, so that direct practical and forceful measures can be taken to prevent violation of Code requirements.*



# CONSTRUCTION CODE

UPON ONE POINT ALL THE LETTERS WHICH FOLLOW ARE AGREED; NAMELY, THAT THE CODE HAS INCREASED OR IS LIKELY TO INCREASE THE COST OF CONSTRUCTION. SOME EXPRESS FEAR THAT THE INCREASE WILL DETER BUILDING; OTHERS POINT OUT THAT SUBNORMAL PRICES AND WAGES DID NOTHING TO STIMULATE BUILDING BEFORE THE CODE WAS ADOPTED. THE LETTERS ARE INDIVIDUALLY INTERESTING AND THE MAJORITY CONTAIN SUGGESTIVE EXPERIENCES. HOWEVER, THE GROUP AS A WHOLE DOES NOT, AND WAS NOT EXPECTED TO, WARRANT CONCLUSIONS OF GENERAL APPLICATION.

## RUDOLPH S. ADLER

Hentz, Adler and Shutze, Architects  
Atlanta

*I think that the Code will increase, and already has materially increased, prices in the industry. I think that the costs in the South particularly, where labor has not been organized as it has in the northeast sections of the country, will be materially affected and at first will tend towards a certain amount of inefficiency. Although many large contractors disagree with this belief of mine, I still hold that labor conditions will be materially changed.*

*Heretofore reinforcing steel for concrete was tied together by men particularly fitted in this trade but was placed either by carpenters or common labor. Concrete was poured by common labor, whose maximum wage per hour in the very highest times was 25 cents. I have been told that in the organized sections of the country steel is matted together by specialized workers, as well as placed by specialized workers belonging to the trades unions.*

*In house construction where steel columns or beams were used to support a heavy weight in the floor above, carpenters on the job were employed to set this steel and carpenters, brick masons or common labor set steel angle lintels above window openings on brick or hollow tile veneer jobs. Now of course it will be necessary, if the trades unions enforce the letter of the law, to have a steel-worker on a house job practically at all times during the erection of stud walls and floor joists as well as on brick veneer jobs if any steel occurs in the work.*

*I am heartily in favor of the Code and believe that Article 7 of Chapter 1 will be beneficial, in that unscrupulous owners will not be permitted to beat down bid prices.*

*Article 3, Section 2, B-3 (a) would seem to void entirely the status of the draftsmen so far as a 40-hour week is concerned, and unless this particular sentence is clarified in the Architects' Code, would work to a great disadvantage for the draftsmen. It has been common practice by many architects in the South to work men with high pay for ten, sometimes twelve, hours a day on rush work without extra compensation, which of course is totally unfair to the draftsmen. In fact, on rush work where a job has been promised by our office, we have resorted to this practice possibly for a week before the job actually had to be finished; but we always gave the men a week or two of leisure after this rush work had been completed.*



Irving Allen Fox

TEMPLE H. BUELL



Blank & Stoller

ELY JACQUES KAHN



J. Zweifel

H. I. SCHENCK



Walton Studio

S. A. LAYTON

### FRANK D. CHASE

Frank D. Chase, Inc.  
Engineers and Architects  
Chicago

### TEMPLE H. BUELL

T. H. Buell and Company, Architects  
Denver

*Code prices for materials are generally higher throughout the country than they were prior to the establishment of the Code. In many instances manufacturers are taking unfair advantage of the Code to increase costs beyond any reasonable level. Some Codes have practically no control over the retail prices.*

*Building costs will be higher, too, under the Code because of labor regulations.*

*First, it is generally conceded that the Code will raise building prices to a plane substantially higher than they are at present; that the advantages in this would far outweigh the disadvantages inasmuch as, if building were dependent on price alone, there would have been more construction during the period such as we have experienced during the past few years when prices were on rock-bottom.*

*It will permit the production of materials and the employment of workmanship far in advance of the generally accepted standard of the past decade, resulting in buildings in which the factor of depreciation would be reduced to a minimum and bring us to the time when we could more nearly approximate the craftsmanship which has characterized the great eras in architectural development. Second, the practical advantages or disadvantages in any particular Code requirements are much mooted questions and although all trades and divisions of the industry have given a great deal of time and thought in their preparation, the eventual solution can only be the result of the practical functionings of each, and the way in which each dovetails in with all others.*

*The construction industry is a tremendous one in America and one in which changes must necessarily come slowly because of its character.*

*The changes which have come into effect with the Code are in many instances momentous but are logical and will, I feel, redound to its great benefit.*

**ELY JACQUES KAHN**

Architect  
New York City

**HARRY I. SCHENCK**

Schenck and Williams, Architects  
Dayton, Ohio

**S. A. LAYTON**

Layton, Hicks and Forsyth, Architects  
Oklahoma City

*The Construction Code seems to aim in two directions: (1) the stabilization of costs for building which has already developed into rising prices, and (2) the very important matter of preventing unfair practice in the handling of estimates.*

*Cutthroat competition has been the curse of a good deal of our work, and if the Code strengthens the position of those who really desire to maintain a high standard of accomplishment, it will have done an important service. It is sufficiently difficult in normal times to avoid the thought that estimates are not always bona fide and that the bidders assume that an adjustment is bound to be discussed. Now that competition is so intense, the possibilities of bargain hunting become far more serious, with the result that, without the Code, every one concerned would be at a loss to feel certain of preliminary figures or final estimates.*

*Of course, one of the great problems is the owner who, not being a member of the industry, is hard to control when he takes it into his hands to put pressure on his architect or builder.*

*In our field the effect of the Code on building costs has been very promptly to bring the total cost of building to fully equal the peak prices. Since peak prices always were too high to justify any form of investment building, as well as home building, the effect is to discourage completely all construction that is not a positive necessity.*

*There are both advantages and disadvantages in the Code requirements too extensive to discuss in a brief paragraph. It is not to be denied that there have been many destructive practices in the construction industry which need correction. The Code presumes to remedy the custom of "bid peddling and chiseling" which will be as impossible as was the enforcement of prohibition.*

*The Code stipulates what architects must do to help enforce the contractor's code requirements, but, as we interpret it, contractors are not required to refrain from invading the field of the architect and may freely continue to furnish plans as well as construct projects of even major importance.*

*It is our purpose to cooperate to the fullest extent while the Code is in operation, but we have already observed certain methods of evading the code regulations, which seems to be the usual tendency following any measure of legislative reform.*

*First, the effect of the Code on building costs will be materially to increase the cost of building. Second, as to the particular advantages or disadvantages of the Code as written, I cannot see that it will have any particular effect upon securing fair competition, because public sentiment seems to demand that contracts be let to the lowest bidder and public officials will not go against public sentiment and take due consideration of the character and financial responsibility of bidders and award contracts fairly on this consideration.*





Yago

ALBERT KAHN



W. B. Poynter

H. E. HANNAFORD



BEN F. McMURRY



Irving

EMERY ROTH

### ALBERT KAHN

Albert Kahn, Inc.  
Architects and Engineers, Detroit

*The Code is to be commended, particularly for its aid in preventing "bid peddling." As to its limitation on the permissible number of working hours, I am not so certain. Building costs will no doubt be increased under the new regulations, but experience has proved that ruinously low costs never stimulate building. Neither do excessively high costs for that matter, but material men as well as contractors are entitled to a reasonable profit which, during the depression, has not obtained. Indeed, existing conditions have spelled bankruptcy for many. The Code will no doubt require revision after fair trial, but I am for it.*

### GORDON B. KAUFMANN

Architect  
Los Angeles

*The effect of the Code locally has been to increase costs without increasing the volume of building. Where fixed Code minimum prices are quoted, these appear to become adopted. The architect should not be placed in a position to recommend one firm where there is no difference in prices. The result is that the owner selects the weakest subcontractor and strikes a private bargain with him—to the detriment of the rest of the "competitors." That is the weak spot of all Code requirements and will be until the control of prices is definitely eliminated.*

### H. ELDRIDGE HANNAFORD

Samuel Hannaford and Sons, Architects  
Cincinnati

*In our opinion the Code will abolish the building industry's greatest evils and will be the means of preventing the further pauperizing of many reputable contractors. Article 7 and its various subsections, which prevent bid peddling, collusion between bidders and so on, are splendid provisions.*

*It is obvious that construction prices will increase under the Code, but there are other reasons why prices will be higher. The industry has been impoverished for the last few years due to bid peddling and cutthroat practices, and it is time that conditions change.*

**BEN F. McMURRY**

Barber and McMurry, Architects  
Knoxville, Tenn.

*One thing of great importance resulting from the development and adoption of the Code and the activities of the Construction League is the unification and consolidation of the construction industry. In the past we have been operating as several separate and distinct groups, forgetting that the designing and construction of buildings is one big industry. It is our opinion that the Code in operation will do much to impress this fact.*

*The effect of the Code on building costs has been to increase costs materially over the low point of early 1933, but we do not believe it will raise costs as high as the peak reached between 1926 and 1929, nor do we believe that the higher costs will be prohibitive or will prevent construction work going ahead when improvement of business in general supplies the urge.*

*The most practical advantages obtained in the Code are embodied in Article 7 concerning Competitive Bidding Practices. If the regulations prescribed under this heading are enforced and lived up to in the right spirit by all parties concerned, much good will come from them.*

**EMERY ROTH**

Architect  
New York City

*In my opinion the effect of the Construction Code will be to raise the cost of buildings. This result was foreseen and, in as far as it provides better conditions in the hours and wages of labor, will on the whole be beneficial to the building industry, and function along the lines intended by the "New Deal."*

*My adverse comment on the Code is that one of the parties interested in construction—namely the owner and investor—is not represented on the Authority, nor has he been heard from or considered in the making of the Code. I refer particularly to Article 7 (Competitive Bidding Practices). This section, while intended to stop bid peddling and bid shopping, is very apt to lead to bid collusion. One of my first experiences since the Code went into effect was a bid for some casement sash. Of the three bidders, each deals in different steel shapes, uses different fittings and different methods of manufacture, and yet the three estimates were identical to the penny and considerably higher than I had previously been able to get casement sash for. I do not claim there was any collusion in this, but had their estimates been double what they actually were, I should have been placed in the position of having to accept their bids.*

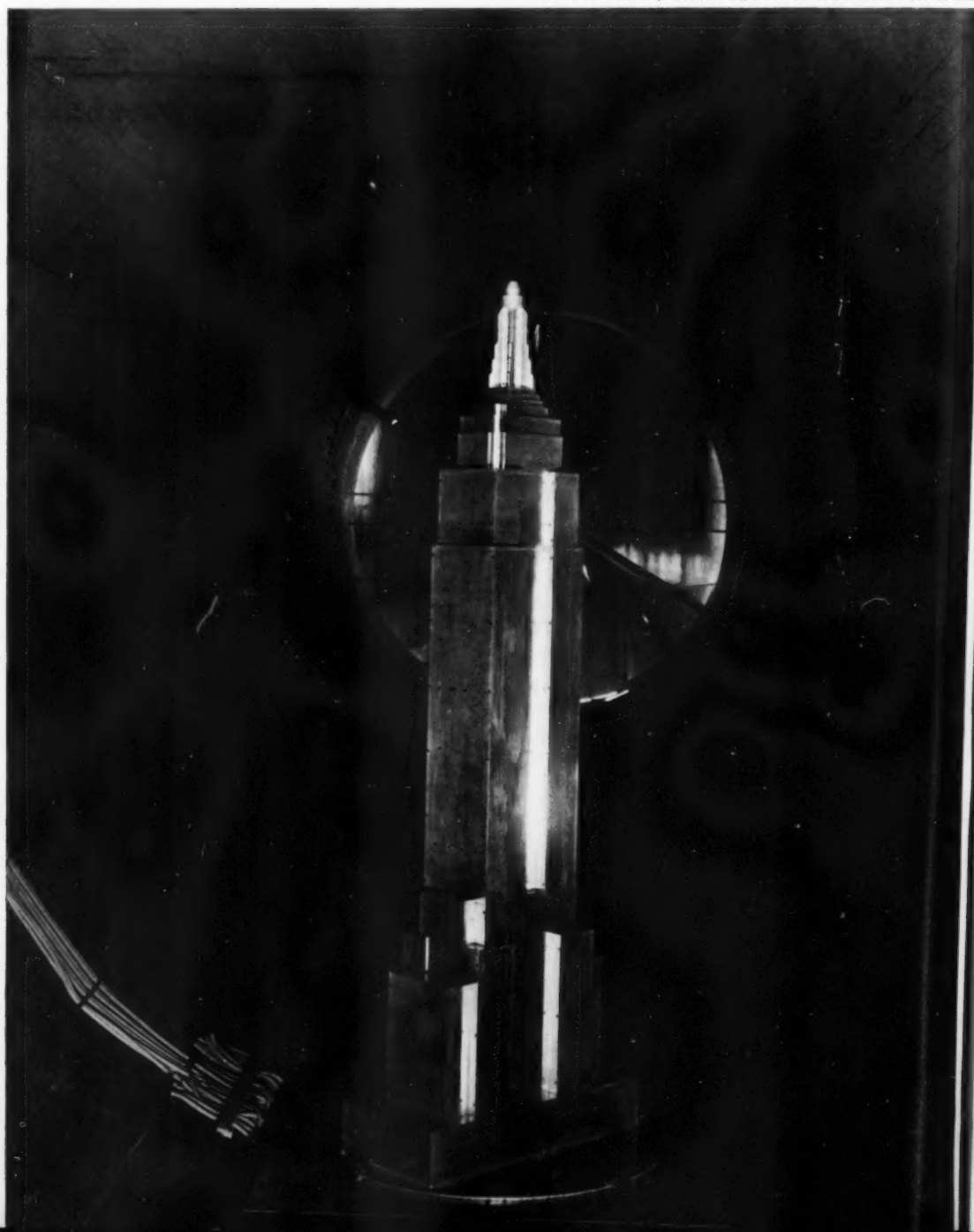
*There is a difference between dishonest chiseling and negotiating, and I believe that negotiation is essential to any business. I also believe that more progressive methods are employed in the building industry when there is keen competitive figuring, and that the trade becomes slipshod when liberal prices prevail.*

*In my opinion Section 7 should be revised with due regard to both owners and builders and also the building trades. It would be sufficient for every purpose to provide that no work shall be taken at less than cost including a reasonable overhead.*

# MUNICIPAL BUILDING

TO DETERMINE THE EFFECT OF WIND PRESSURES ON LARGE BUILDINGS THE BUREAU OF STANDARDS HAS CONSTRUCTED THIS 5-FOOT MODEL OF THE 1,250-FOOT EMPIRE STATE BUILDING. THE SCALE MODEL, MADE OF ALUMINUM EXCEPT FOR THE WOOD TOWER, WAS DESIGNED TO BE TESTED AT VARIOUS POINTS. IT WAS MOUNTED IN THE WIND TUNNEL AND WIND GENERATED BY A PROPELLER WAS BLOWN AGAINST IT AT VELOCITIES OF 27, 41 AND 55 MILES AN HOUR. A ROTATING TURNTABLE ALLOWED THE PRESSURE OF THE ARTIFICIAL STORM TO BE MEASURED ON ALL SURFACES AND AT ALL ANGLES. THE PRESSURE VARIES FROM POINT TO POINT, ACCORDING TO PROFESSOR C. L. HARRIS OF PENNSYLVANIA STATE COLLEGE. OVER THE LARGER PART OF THE MODEL IT IS REDUCED. NEIGHBORING STRUCTURES ALSO HAVE AN ENORMOUS EFFECT ON A SKYSCRAPER: THE PRESSURE TENDS NOT ONLY TO SHEAR AND OVERTURN A BUILDING, BUT ALSO—A NOT GENERALLY RECOGNIZED FACT—TO TWIST. IN A BUILDING THIS TWISTING FORCE IS APPLIED FITFULLY AND UNEQUALLY BECAUSE OF SURROUNDING STRUCTURES.

*U. S. Bureau of Standards, American Standards Association*





# REGULATIONS

## Revise Building Codes Now

By WILLIAM LYNCH MURRAY, Architect

**F**EW building codes are in effect today that do not severely penalize building construction. Even those codes adopted recently impose regulations which achieve only added construction costs, while those of a decade or more ago are for the most part entirely obsolete. These obstructions are retarding building activity now and unquestionably they will impede the programs which are certain to follow when building money becomes more readily available.

The era when money could be lavished on labor and materials, regardless of building costs, is gone. Construction activity will continue at its present low ebb regardless of improvement in other industries unless building regulations are revised to permit justifiable economies, based on the accumulated evidence of scientific tests and on experience, making possible a closer approach to the minimum consistent with safety.

Low-cost housing and slum clearance should be holding the center of the construction stage in many cities right now. Instead, activity is being postponed in most instances because of municipal building regulations which, if followed, would wipe out every possibility of making the buildings pay their own way. An example of this is to be found in Philadelphia where the City Planning Commission in attempting to eliminate code barriers has retained D. Knickerbacker Boyd to act as its director of code revisions. The Philadelphia building code was adopted in 1929.

Before studying in detail some of the impositions to be found everywhere in building regulations, let us consider a significant statement made by the United States Senate Committee on Reconstruction and Production: "In almost every city where hearings were held statements were made to the effect that local building laws required more materials and refinements of workmanship than were justified. . . . They involve an additional cost of construction without assuring more useful or more durable buildings."

**P**ROHIBITIVE restrictions keep garage construction at a minimum. Buildings of this class in most instances are required to be fully-protected fireproof construction, regardless of size, location, dividing fire-walls or sprinkler equipment. Reasonable regulations would encourage this type of building, which is quite a field when one considers the abundance of open-air parking lots

and the increased regulatory measures being adopted to limit street parking and to break up all-night parking.

Revision groups should give serious attention to the minimum requirements recommended for such structures by the Building Code Committee of the Department of Commerce. Their recommendations follow the very latest technical thought on the subject and vary with specific site conditions, the type of construction employed, and whether or not sprinkler equipment is provided. Briefly, their recommendations are as follows:

- (A) *Fully-Protected Fireproof Construction*: No restrictions.
- (B) *Protected Construction* (Light fireproof, as bar joists, etc.):
  - (1) *Not Sprinklered*. 25,000 to 50,000 square feet, when not over 50 feet high.
  - (2) *Sprinklered*. 50,000 to 100,000 square feet.
- (C) *Mill Construction*:
  - (1) *Not Sprinklered*
    - (a) *One story*. 20,000 to 40,000 square feet.
    - (b) *Two story*. 10,000 to 20,000 square feet.
  - (2) *Sprinklered*
    - (a) *One story*. 40,000 to 80,000 square feet.
    - (b) *Two story*. 20,000 to 40,000 square feet.
- (D) *Ordinary Construction*:
  - (1) *Not Sprinklered*. One story, 10,000 to 20,000 square feet.
  - (2) *Sprinklered*. One story, 20,000 to 40,000 square feet.
- (E) *Frame Construction*:
  - (1) *Not Sprinklered*. One story, 3,000 to 6,000 square feet.
  - (2) *Sprinklered*. One story, 6,000 to 12,000 square feet.

Site conditions, such as whether or not the lot is on the corner of two or more streets, accessibility for fire fighting, and the like, are the factors which determine when the minimum square footage figures may be exceeded.

**A**S much as 30 per cent can be saved in concrete sizes and concrete costs where tests based on performance are used instead of the antiquated method usually prescribed in building codes of basing concrete design on conventional low fiber stress limits.

No material has received the intensive study during the last few years that has been devoted to concrete. In accordance with the water-cement ratio theory, tables have been worked out which serve as a guide in mixing for the particular strength desired. The use of the water-cement ratio not only eliminates much of the guesswork in concrete, but also provides a reward for merit to those who work with laboratory control by permitting them to take

advantage of higher stresses as recommended by authorities everywhere. To secure economical and sure results, requirements should be altered to conform to these new findings.

Many cities still use a basic stress of 16,000 pounds per square inch in the design of structural steel. If the conventional stress is raised to 18,000 pounds per square inch, as recommended by the country's most prominent engineers, it is estimated that a saving of 12 per cent can be accomplished on steel and steel erection costs.

**P**ERHAPS one of the heaviest penalties imposed by building codes is in the stipulated live load minimums governing every type of structure. One authority states the case splendidly as follows: "Traditional live load figures insisted upon in many codes suffer severely in the light of scientific inquiry. The simple process of weighing the contents of floors in typical occupancies has thrown light on the whole subject and has pointed the way to a more rational treatment."

The following study indicates that it is not unusual for a code to specify a required live load 8 to 10 times as great as the superimposed load can ever equal.

A typical example is to be found in average requirements governing schoolroom floor loads. Several codes were selected at random and the average for classroom live load design was 82 pounds per square foot, some cities requiring as much as 125 pounds.

The need for setting a more reasonable figure is apparent when it is considered that the maximum load that could possibly be placed in a classroom approximates 28 pounds per square foot. This figure is based on a standard classroom 23 by 32 feet with a capacity of 45 pupils and a floor area of 736 square feet. However, to arrive at an absolute maximum load, it was assumed that two adults were placed on each seat with 30 persons grouped around the walls, making a total occupancy of 120 persons having an average weight of 150 pounds, or a total of 18,000 pounds. The weight of 45 desks at 40 pounds each adds 1,800 pounds; the teacher's desk was set at 400 pounds with an allowance of 10 pounds for each of the pupil's books, and 250 pounds added for odds and ends, or a grand total of 20,900 pounds. Instead of the 28-pound maximum, the figure would have been only 10 pounds if the normal occupancy of 45 pupils had been used in making the computations.

There can be no excuse on any basis for requiring a live load minimum in excess of 40 pounds per square foot in the design of schoolroom floors, and codes should be altered to conform to such standards.



**T**HE report of the Building Code Committee of the Department of Commerce recommends that codes require wood floors in dwellings, to be designed to sustain a live load of 40 pounds per square foot, and floors of monolithic construction be designed for 30 pounds per square foot. This recommendation was made after much research and careful study. The heaviest furniture loads discovered by investigators were pianos, weighing up to 55 pounds per square foot, and bookcases weighing up to 170 pounds per linear foot, but in both cases the distribution was such as to bring the equivalent uniform load well below that recommended. The reported observations of many architects and builders are that the furniture and occupancy loads in residential types of structures seldom exceed 50 per cent of the recommended minimum design load, even in extreme cases. Regardless of such recommendations from authoritative sources, 29 cities require minimum live load design of 50 pounds per square foot; 42 cities require 60 pounds; 4 require 70 pounds; 1 requires 75 pounds, and so up the scale until 1 city is reached requiring 100 pounds. In other words, out of 109 codes studied, only 27 permit the use of reasonable design figures.

The same committee recommends that floors in office buildings be designed for a live load of 50 pounds per square foot. The recommendation also states that provisions shall be made in designing office floors for a load of 2,000 pounds placed upon any space  $2\frac{1}{2}$  feet square wherever this load upon an otherwise unloaded floor would produce stresses greater than the 50-pound distributed load.

To ascertain the average requirement, 101 codes were studied. It was found to be 114 pounds per square foot. Of the cities 30 required a minimum live load design of 100 pounds, while 27 required a minimum of 150 pounds.

In a recent investigation by an authority in an office building, it was found that the weight of furniture per square foot averaged slightly over 7 pounds, with the heaviest load totaling  $11\frac{1}{2}$  pounds. All files, desks and the like were considered as being 100 per cent full or furnished with all necessary accessories. Weight of employees, computed at the rate of 150 pounds each, added 1 to 2 pounds per square foot of floor area.

Other investigations from time to time showed a somewhat higher average, and the committee took into full consideration heavier loadings in making their recommendations.

In a crowded hospital ward the live load per square foot was found to be 9 pounds. The Building Code Committee of the Department of Commerce and other authorities recommend a minimum live load design of 40 pounds per square foot. These facts do not alter the requirements in many cities which

call for designs far in excess of 40 pounds and even up to 150 pounds in several localities.

One typical fireproof building, picked at random, was checked recently by the writer. The survey revealed that the total cost of the structure could have been pared 19 per cent by substituting for the local code requirements a live load design twice as great as the floors would ever be called on to sustain. In considering these various excessive live load requirements, it should be borne in mind that the effect is cumulative. The sum of the increased dead load and the excess live load represents the additional weight for which columns, foundation walls and footings must be designed, or if it is a wall bearing job, the walls may have to be increased to sustain the excessive beam loads.

The added cost of oversized floor construction is strictly a penalty, and does not accomplish any constructive results. Certainly codes should be altered to remove such penalties by making them conform with authoritative recommendations such as those of the Building Code Committee of the Department of Commerce and other competent sources.

**A** COMPILATION by the Common Brick Manufacturers' Association of America of the allowable thicknesses of solid brick exterior walls as given in 113 building codes, discloses that 25 of the cities will not permit walls less than 12 inches thick in one-story dwellings, while 31 require walls not less than 12 inches thick in both stories of two-story dwellings. These conditions prevail regardless of the fact after extensive research the Building Code Committee of the Department of Commerce recommends that exterior solid brick bearing walls of one- and two-story dwellings may be 8 inches thick when not more than 30 feet in height. Seventy-six building inspectors from various sections of the United States expressed their opinions recently on this subject, almost unanimously endorsing the use of 8-inch walls for one- and two-story brick dwellings.

Such an unnecessary penalty placed on buildings of the dwelling class cannot help but retard construction in this field, while everything else is being done to promote it.

It is difficult to believe, but true nevertheless, that of 84 building codes examined, 30 do not distinguish between panel walls supported at every story and bearing walls or nonbearing walls not thus supported. Six codes recognize panel walls as a separate class, but require that their thickness for the lower stories be increased with the height of the building in the same manner as for walls not thus supported. No explanation is needed to emphasize the ridiculousness of such procedure.

While it is virtually impossible to arrive at any percentage of cost which might

be saved on the average building if the requirements covering wall thicknesses were put on a scientific basis, it is reasonable to assume that the saving would approximate or surpass an ethical architectural fee for designing the structure and supervising its construction.

**S**AFETY must not be sacrificed for economy. We are not advocating a compromise with unsafe or untried methods, but simply the enactment of sane regulations based on authoritative data. It is imperative that codes be made to require only common sense standards based on the latest engineering thought and trends, with the penalties to satisfy whims, and trade and labor organization fancies, abolished.

It is definitely incumbent upon the architectural profession to take the lead in seeing that these reforms are instituted. By securing the aid of various civic organizations, it is not difficult to interest local authorities in making the necessary revisions. Inertia on the part of the architects has had much to do with the continuance of obsolete codes. When they become definitely interested and show their willingness to cooperate in securing common sense regulations, local organizations and local authorities are usually ready to follow the lead.

In organizing a committee to formulate a draft of a new code, care should be taken to secure a diversified group, which should include the following: architect, structural engineer, sanitary expert, general contractor, chief of the fire department, master mason, master carpenter, and the head of the local building bureau. It is essential to secure the services of a specialist in this field to assist the committee in avoiding common errors and to make available the latest information from research laboratories and technical organizations. It should be needless to state that it is entirely fallacious to think that copying the code of another city will achieve ideal results.

Special consideration should be given to regulations governing multi-family buildings. Great emphasis, with government assistance, is going to be placed on housing during the next few years. Every artificial barrier should be removed by revision groups so that the full benefits to be derived from such structures may be obtained. The example that Philadelphia is setting should be followed by all progressive communities.

A wealth of material is available from many sources to guide these revisions. The various publications of minimum requirements and recommended standards by the United States Department of Commerce are invaluable in securing data for this work. A publication by George N. Thompson, "The Preparation and Revision of Local Building Codes," published by the Municipal Administration Service, contains much pertinent information, as the title suggests, and lists many sources of authoritative data.



# Obsolescence as a Factor in Building Regulations

In an article, *Revision of Building Codes to Meet Changing Conditions*, published in the November 25, 1933, issue of *The Real Estate Record and Builders' Guide*, Frank Burton, former building commissioner of Detroit, analyzes three factors which must be considered by building officials in drafting regulations:

- (1) What constitutes a proper measure of *physical safety*?
- (2) What degree of *fire resistance* is adequate for structures presumed to be fireproof?
- (3) What degree of *permanence* is necessary in a structure?

The work of the Bureau of Standards and the Underwriters' Laboratory is directed toward supplying answers for the first two questions. The third question, according to Mr. Burton, has proved most difficult of all:

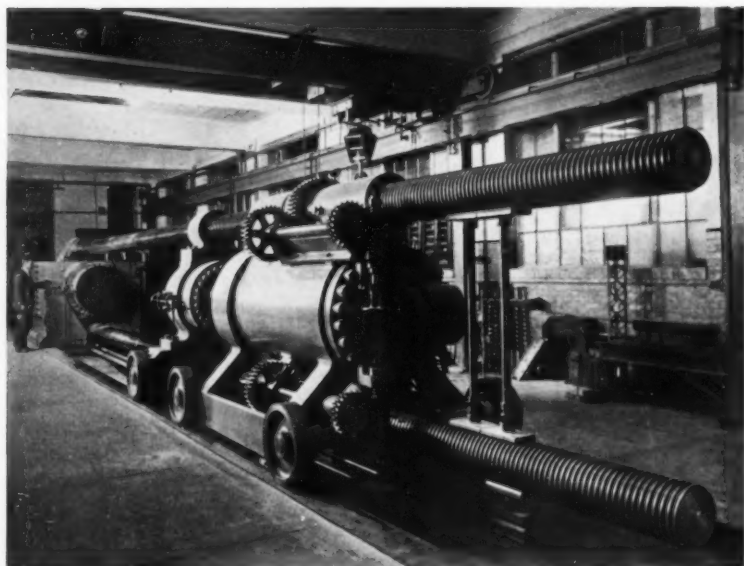
The old viewpoint was that a house should be built to last for generations. Men built houses expecting that their sons and grandsons would use them. We know now that at least as far as American cities are concerned this point of view is wrong. Constant change in form, appearance and materials is demanded by popular tastes and, except for the slight recession due to the depression, this tendency grows stronger each year. Some have gone so far as to say that houses should be designed to last only a few years and should be replaced from time to time. . . . Building permits for such structures should be issued only for a short period at the end of which the structure should be dismantled. Building officials, so far as I know, have never seriously considered the propriety of giving a permit for a dwelling that was not constructed of what they considered permanent materials, in spite of the fact that when a frame house is erected on posts it is known that the posts will rot in about 15 years, the sills in 25, the shingles in 12 to 15, the siding in 35 to 40 years. Such a structure is hardly permanent. . . .

A limited life-span for buildings, as a control device to prevent the accumulation of obsolete structures and to promote the optimum use of new designs, has been suggested by K. Lönberg-Holm in an article, *Time Zoning as a Preventive of Blighted Areas* (see the November 1933 issue of *THE ARCHITECTURAL RECORD*, pages 340, 341):

The socio-economic desirable life spans—as opposed to life spans determined by potential private profit, would at present probably be found in most cases to be less than ten years, and would vary according to flexible time-use zones based on latest findings of socio-economic trends.

Time zoning would involve a license provision for the parking of any form of shelter for a given time on a given site, with the obligation for the erector-owner to remove the unit and clear the site when the license expired. The license could be renewable until occupancy became a public nuisance or liability. The licensee should be required to post bond with the city to insure compliance with the terms of the licensee.

# MUNICIPAL BUILDING



HIGH PRECISION EMERY TESTING MACHINE. CAPACITY 2,300,000 POUNDS IN COMPRESSION, 1,150,000 POUNDS IN TENSION. BUREAU OF STANDARDS.

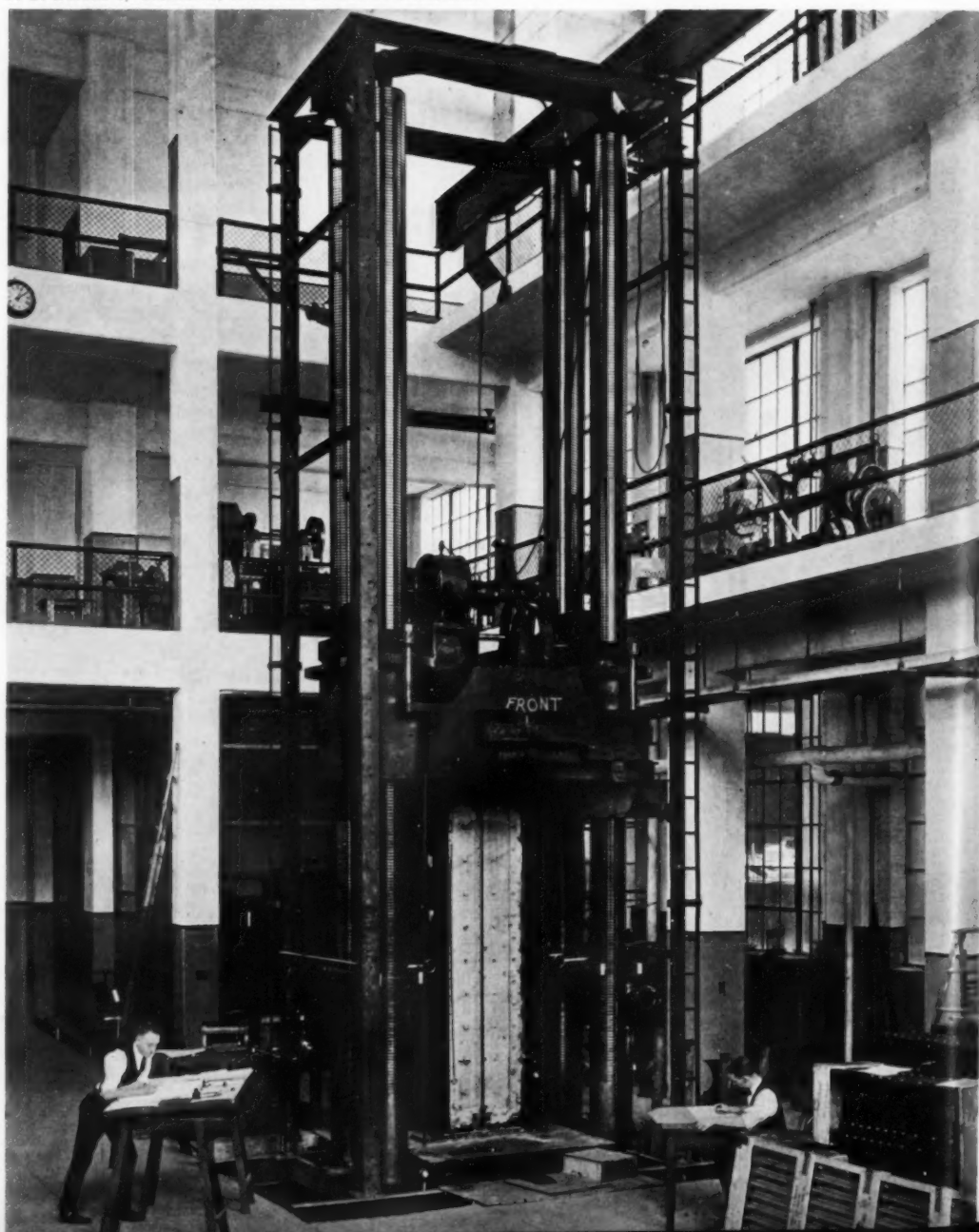
COLUMN UNDER TEST IN 10,000,000 - POUND TESTING MACHINE. BUREAU OF STANDARDS.

*U. S. Bureau of Standards, American Standards Association*

The building code program of the American Standards Association, described in the following article, was the subject of an address by Dr. Agnew at the Joint Conference of Building Officials of America and the New England Building Officials Conference, held in Boston during April.

Until 1928 the American Standards Association was known as the American Engineering Standards Committee, originally organized by the American Society of Civil Engineers, the American Society of Mechanical Engineers, the American Institute of Electrical Engineers, the American Institute of Mining and Metallurgical Engineers. This group served as a clearing house for national standards and was soon expanded to include in its membership many trade and technical societies other than the organizers. One of the chief functions of the AESC was to establish contact with international standardization work through the medium of the International Standards Association.

Today the American Standards Association has 39 member-bodies, including several Government departments. It has approved 226 standards and safety codes as American Standards and has nearly 200 more in process of development.



# REGULATIONS

## BUILDING CODE ACTIVITIES OF THE AMERICAN STANDARDS ASSOCIATION

BY P. G. AGNEW

**A**T the time the Building Code Committee of the Department of Commerce was founded progress was believed to be secured more quickly by recommending standards of practice in those portions of building codes subject to the greatest general criticism. This basic principle led to the development of the series of reports on the various phases of building construction now so well known and recognized throughout the United States. These efforts have gone far in rationalizing building code provisions and have resulted in laying a firm foundation for future progress in this field.

Last summer representatives from the Department of Commerce came to the American Standards Association with a proposal that it assume responsibility for certain standardizing activities previously carried on by the Government. Unforeseen events have delayed the time when it seemed advisable to continue actively the work on building codes. That time is now at hand.

A plan of cooperation has been developed with the Bureau of Standards on various phases of standardizing problems. The plan in a nutshell is this: the American Standards Association is to assume responsibility for the development of building codes; the Bureau of Standards is to furnish whatever assistance it can on research and testing in connection with technical questions that may arise.

The value of the Bureau's research and testing on fire resistance of construction materials and assemblies, on the compressive strength of masonry walls, on mortars, on stucco, on wind pressures and on much of the equipment that goes into a modern building, is well known. Many other laboratories have also added to the available supply of knowledge concerning building materials and appliances. Without such tests, progress would be made exceedingly difficult. It seems especially fortunate that the Bureau offers to continue its excellent work in this field.



**T**HOSE who are not familiar with the activities of the ASA may not fully understand its relationship to building codes. The most recent code published as an American Standard which is closely tied up with building code regulation is the Safety Code for Elevators, Dumbwaiters, and Escalators. The first edition was published in 1921 and was prepared by a committee of the American Society of Mechanical Engineers with the assistance of manufacturers, insurance carriers, and regulatory bodies.

The practical application of this Code in the formulation of state regulations and municipal ordinances pointed the need for its further development. The American Society of Mechanical Engineers then requested the ASA to authorize a revision of the Code under its procedure. This was done through a sectional committee on which all the groups concerned were represented, and under the joint leadership of the American Institute of Architects, the Bureau of Standards and the American Society of Mechanical Engineers. This sectional committee held meetings for two years and in 1925 the revised code was published as an American Standard.

After publication of this standard, the need for research and testing on the design and construction of auxiliary devices for elevators became more apparent. Consequently, a Subcommittee on Research Recommendations and Interpretations was appointed. Under the auspices of this committee an extensive testing program was carried on at the Bureau of Standards and was financed by the industry through the Subcommittee.

The results of this series of tests, the experience of State and Municipal officials with regulatory provisions of the code, the ever-increasing need for more knowledge of elevator installation for high buildings, prompted the Sectional Committee to undertake a revision of the 1925 code to clarify some of the rules as well as to include those advances which had been made in elevator construction and installation.

This second revision was published in 1931. An important feature of this last revision was the character of the membership of the sectional committee responsible for the work. It consisted of 37 members fully representative of the building, manufacturing, insurance, and governmental interests.

At many other points our work has been closely related to building regulation. The National Electrical Code and the National Electrical Safety Code have been approved as American Standards. Quite recently approval has been given to standards to safeguard building operations. Many other American Standards concerning civil engineering and building trades, mechanical and electrical engineering form important sections of the technical content of building codes, such as the Fire Tests of Building Construction and Materials, and the Code on Ventilating Standards now under way.

In addition to the standards already mentioned, the ASA has been instrumental in the development of specifications for materials used in building construction. It appears likely that material standards will play an increasingly important role in future building codes.

The relation of this considerable group of standards already completed or under way to building codes has been well summarized by a definition of a building code given by George N. Thompson in a symposium on building codes\*:

"The building code is a medium through which standards—standards of quality, standard methods of tests, and so on—may be correlated and made to function as a smoothly working piece of machinery in the interest of protection of the public."

**W**ITH respect to building codes generally, a number of points have appealed to me as a layman. In the first place, there appears to have been a decided tendency to perpetuate obsolete requirements. Evidence of this is given in the mimeographed circular entitled, "Status of Municipal Building Codes," compiled by the Bureau of Standards. For 1933, according to this summary, 108 cities had building codes 20 years old or over; 37 had building codes 15 to 20 years old; 216 had building codes 10 to 15 years old; 420 had building codes from 5 to 10 years old; and 296 had building codes less than 5 years old. In addition 453 cities reported that they had no building codes. At least some of the requirements in these building codes must mean an added burden on the pocketbooks of future building owners. What may be important, their provisions may not insure adequate protection of the public health and safety. Secondly, the burden imposed on a municipality which has arrived at the point of building code revision is enough to break the camel's back. An excerpt from the *AMERICAN ARCHITECT* for March, 1932, illustrates this point:

"The time and effort required to completely revise a building code is demonstrated by a few statistics gathered from the New York Building Code Committee. The work was divided into six main parts, each under the direction of an architect, engineer, or contractor. Twenty committees comprising 125 individuals were formed, more than 476 committee meetings were held, of average duration of 3 hours, representing a total of about 1,420. The average attendance was 7, making a total of about 10,360 man hours. This did not include informal conferences which if included, it has been conservatively estimated, would represent a total of over 20,000 man hours of labor in committee meetings, conferences and study."

And this proposed New York Code has not yet been made law! Similar instances have occurred in Chicago and Detroit, and perhaps on a lesser scale in municipalities all over the country. The situation becomes discouraging when

\*INDUSTRIAL STANDARDIZATION,  
October, 1933, page 161.

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it is necessary for the fruit of technical effort to rot on the tree because politics prevent its being harvested.

With the exception of the largest cities municipalities in general evidently have not had the staff, time, or funds to conduct the research essential in order to prepare amendments to building codes which will keep them up-to-date, rational, and reasonably standardized. Most states have either neglected responsibility in this connection or have not had the funds and facilities to undertake the task.

The public attitude toward building regulation is almost too lethargic to mention. Recently Los Angeles rejected a bond issue to rebuild and strengthen school buildings in the face of the clamor raised by some citizens last year about unsafe schools and building regulations.\*

**T**HE increasing tendency to put provisions of building codes on a performance basis instead of attempting to lay down detailed requirements as to what is to be used is thoroughly sound. It is an indication of the future trend of these documents. The day is rapidly passing when building codes can be drafted or revised by using shears and paste on those which are already obsolete. Nor will the practice survive in the end where small municipalities endeavor to cut down the code of a large city to fit their size. Construction progress maintains such a fast pace that building regulations, if they are not to lag too far behind, must be founded on a systematic study of test data supplemented by experience in building design, construction and its supervision. The collection of the large amount of test data on building materials now extant, the bringing together at the start of all interested parties, the outlining of necessary research programs, and the work of adapting this test data to regulatory provisions, would seem to be a task for a centralizing agency. Building code work should proceed from the point where it now finds itself. It should not be necessary to retrace steps over much of the ground covered in the past.

There is still need for more reasonable uniformity of fundamental requirements in building codes. Progress has been made, but it has been slow due to the very nature of the work. Building codes must be conservative if unscrupulous builders are to be held to construction standards necessary for public safety.

At present building construction needs all the help it can obtain to reduce cost. Better buildings at reduced costs should encourage building and in turn provide more employment. In the state of New York a project was started not long ago with funds from CWA to study all building codes in the state. One objective of this work is to point out where improvements might be made tend-

\*ENGINEERING NEWS RECORD,  
March 29, 1934, page 422.

ing to lower the construction bill.

A nation-wide program on housing will soon be under way, according to recent reports. The salient features of this program have been summarized as follows:

1. Modernization of existing houses that are worth the cost.
2. Stimulation of new home construction that can be justified economically.
3. Demolition of obsolete construction by discouraging repair of such structures and encouraging new construction.
4. Repair and replacement of industrial structures.

The provisions of local building ordinances will have a direct bearing on much of this proposed construction. The question may arise, are present building code requirements too severe or too lax? Do they hamper construction by requiring excessive amounts of building materials or do they go to the other extreme and permit "jerry-building"?

Representatives of a large research organization expressed the opinion a year or so ago, that local building ordinances might prove a stumbling block in the development of mass production of houses. Whether this is so or not it seems to focus attention on the importance of the detailed provisions of building codes. A delicate balance must exist if equity is to be done to all concerned. While construction is at a low ebb, it would seem to be an excellent time to prepare for future activity. Architects, engineers and building officials are better able to discuss the many phases of the subject when not overtaxed with getting out plans for some irate owner or builder.

Even when the technical problems have been solved and the draft prepared, much may happen to building codes when they are brought before a council for passage. It seems reasonable that the defense of code provisions would be made easier somewhat in proportion to the completeness of the representation inherent in their drafting. Certainly a councilman or mayor should be more convinced of the unbiased standing of any particular code when he understands that such a code represents the combined view of experts from all sections of the country. This broad representation in the preparation of building ordinances offers a solution which should go a long way in removing the suspicion attached to many building codes in the past whether it was justified or not.

There will always be need for improvement in building codes, especially when considered on a national scale. Whatever can be done to broaden the base on which these codes are founded seems to me to be a step in the right direction. It is my hope that with the cooperation of architects and others, the American Standards Association can contribute to this end.



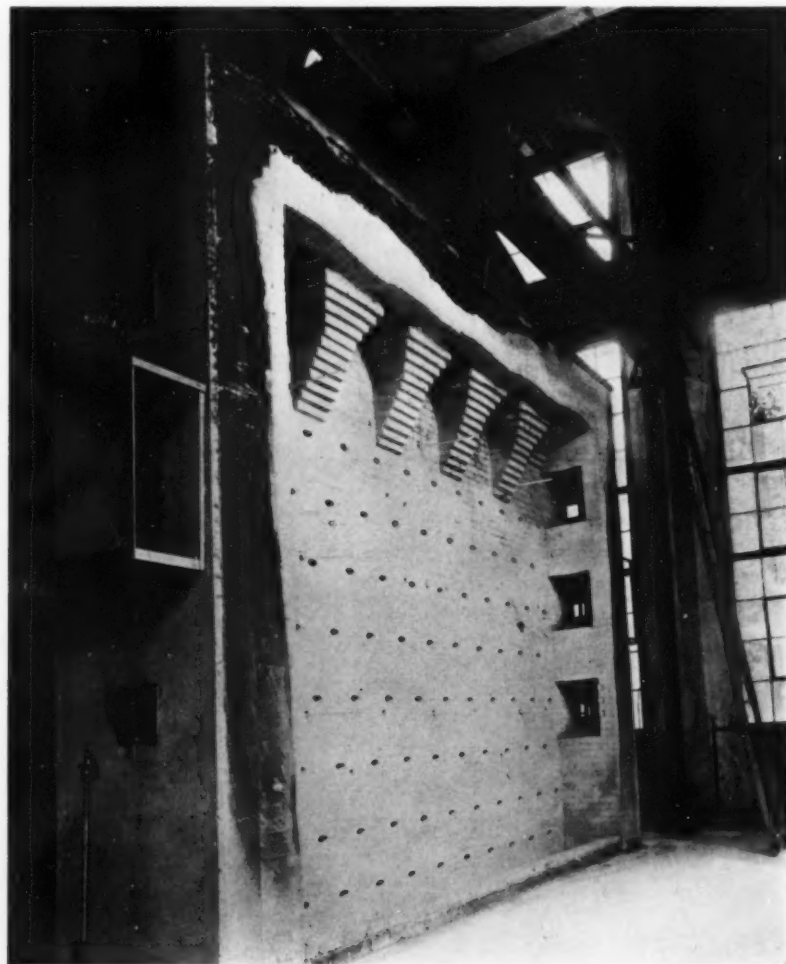
*American Standards Association*

FIRE TESTS ON BUILDINGS IN THE MALL ABOUT TO BE RAZED TO DETERMINE SEVERITY OF FIRES AND PROTECTION AFFORDED RECORDS IN SAFES.



PROGRESS DURING TEST TO DETERMINE SEVERITY OF FIRES IN BUILDINGS.

GAS FURNACE USED FOR TESTING FIRE RESISTANCE OF WALLS AND PARTITIONS. WALL OR PARTITION TO BE TESTED FORMS OTHER SIDE OF FURNACE DURING TEST. BUREAU OF STANDARDS.



EXPERIMENTS CONDUCTED BY  
U. S. BUREAU OF STANDARDS



# FIRE CONTROL IN THE DESIGN OF MODERN BUILDINGS

BY  
PAUL W. KEARNEY

**T**he architect's importance in fire control is fixed by the old adage, "It is easier to fight a fire at the drawing board than at the hydrant." The architect has the greatest influence over fire's two most vital factors:

- (1) Fuel.
- (2) Draft.

Neither can be eliminated: both can be minimized, lessening the possibility of a sweeping blaze. But the man at the drawing board is apt to miss the objective unless he approaches the problem with at least a little of the practical fireman's viewpoint. The best introduction is afforded by a test the U. S. Bureau of Standards made when it burned down a pair of attached, five-story, brick-and-timber buildings being razed for a park project. The structures were in fairly good repair, in the wholesale produce section of Washington and typical of a million other commercial and mercantile occupancies everywhere. The floors were reasonably stocked with packing boxes to simulate a tenancy, and a torch applied on the main floor. The stop-watched progress of the unmolested fire was as follows:

*In 5 minutes the fifth floor was involved;*

*In 10 minutes flames belched from every window in both buildings;*

*In 15 minutes the roof fell in;*

*In 20 minutes the wooden floor joists were burning through;*

*In 28 minutes part of the front wall fell;*

*In 45 minutes all walls above the first floor were down.*

Too much emphasis cannot be placed on the first item: it is the critical factor in many serious outbreaks. At the Baltimore Post Building blaze in 1931 the whole structure was involved two minutes after the discovery of the fire; at the famous Binghamton clothing factory fire ten years ago, 35 employees

HIDDEN DRAFT SPACES ARE THE BANE OF THE FIREMAN'S LIFE. A FIRE MAY BE EXTINGUISHED IN 15 MINUTES BUT IT MAY TAKE AN HOUR TO "OVERHAUL" THE PREMISES, FOLLOWING THE FURTIVE SPARK THROUGH ALL POSSIBLE CONCEALED AREAS. THE REASON WHY FIREMEN TEAR BUILDINGS WIDE OPEN IS THE SIMPLE FACT THAT ARCHITECTS HONEYCOMB THEM WITH HIDDEN VOIDS!





# **DEMONSTRATION OF THE "MUSHROOM FIRE" AT THE NEW YORK FIRE DEPARTMENT SCHOOL**

THIS MODEL REPRESENTS TWO ATTACHED 5-STORY FIRE-RESISTIVE BUILDINGS SEPARATED BY A FIRE WALL. AN OPEN STAIRWAY EXTENDS FROM MAIN FLOOR TO ROOF IN THE REAR. THE FRONT OF EACH FLOOR IS STOCKED WITH SMALL BUNDLES OF EXCELSIOR AND MATCHES APPLIED TO BOTH MAIN FLOORS AT THE SAME MOMENT. THE PICTURE WAS SNAPPED A FEW SECONDS AFTER THE "FIRE" STARTED. THE "APARTMENT" ON THE RIGHT HAS AN AUTOMATIC VENT IN THE SKYLIGHT: THE ONE ON THE LEFT HAS A SECURELY-SHUT SKYLIGHT. WHEN HEAT OF 150° IS PRESENT, A FUSIBLE LINK IN THE AUTOMATIC VENT OPERATES TO RELEASE A COUNTER-BALANCED DOOR. THIS OPENING ALLOWS THE RISING HEAT TO ESCAPE INSTEAD OF COMPELLING IT TO MUSHROOM THROUGH THE BUILDING. THE SMOKE CAN BE SEEN EMERGING FROM THE VENT.



## **APPROXIMATELY 10 SECONDS LATER**

THE FIFTH AND FOURTH FLOORS OF THE UNVENTED APARTMENT ARE ALREADY INVOLVED WITH FIRE: THE CORRESPONDING FLOORS NEXT DOOR ARE SAFE AND THE EXCELSIOR NOT EVEN SCORCHED. BEFORE THE PLATE COULD BE CHANGED IN THE CAMERA, THE THIRD AND SECOND FLOORS OF THE UNVENTED BUILDING WERE BELCHING SMOKE. THE AUTOMATIC VENT, WHEN EQUIPPED WITH AN ALARM SIGNAL, CAN BE AN INVALUABLE LIFE SAVER. IF PROMPT ACTION AGAINST THE FIRE FOLLOWS, IT WILL ALSO HELP THE FIREMEN MATERIALLY BY TEMPORARILY HOLDING THE BLAZE IN CHECK. SUCH VENTS ARE COMPULSORY OVER THE STAGE OF EVERY NEW YORK THEATER.

were dead within five minutes after the outbreak originated, and in thousands of less dramatic cases the building, if not its occupants, is doomed with equal rapidity. The recent wave of New York tenement fatalities demonstrates these points quite graphically: the pity is that the average private dwelling is a worse firetrap than the old law tenement—and will continue to be so long as builders ignore the facts.

The point is that fire's principal mode of travel is by convection. Heated air at around 1000° F. rises under great pressure, follows the ceiling in the original room and then sweeps up from there through every available artery. These may be the open stairwells, elevator and other shafts, or less obvious paths such as pipe recesses, belt openings, ventilating ducts, hollow walls, and so on.

When and if the heated air can go no higher, it spreads laterally—"mushrooms" as the firemen say—banking up under its obstruction and working downward again as pressure and volume mount. At 1000° this air is igniting all combustible furnishings and trim in its uppermost reaches, *starting another blaze upstairs and independent of the original flames*. The classic demonstration of this action occurred in a modern skyscraper with a minor basement outbreak in a cable shaft. The heat went up until blocked by a stone cut-off at the 45th floor; it then worked downward again until it reached an open door at the 36th story. Going up, the unobstructed heat naturally passed this opening: coming back under pressure it flooded through the doorway, ignited the combustibles in those offices, and caused \$100,000 damages on that floor.

In a nutshell, this is the explanation of the first item in the Washington test. It is also the reason why fire control engineers keep harping on their contention that most of our buildings are "built to burn." Even when sturdily constructed, too many are so full of unprotected vertical arteries that any unnoticed outbreak will be a quick spreader if given just a few moments' headway.

**T**his factor is quite as important in the life hazard as in property damage. Long before the rising heat is intense enough to ignite wood, it is fatal to breathe, hence most fire victims are the prey of convection, not flames. Years ago 13 bodies were taken out of one room on the fourth floor of a New York tenement house whose fire never got above the *second floor*, and not a single body had a mark on it. In a country-wide survey of several hundred fatal dwelling fires (mostly private houses), the National Fire Protection Association found that 74 per cent of the deaths occurred on upper floors from downstairs fires. Since two-thirds of all our fire victims die in residential blazes, the factor appears vital.

In schools and other populous public buildings the same principles will apply if not curbed by intelligent building codes. In old schools, especially, the prime failure is to place too much stress on speedy evacuation alone. Exits can never be too numerous or accessible and drills which permit the emptying of a building in 3 minutes are commendable, but both factors are still inadequate in a structure which can be flooded with lethal heat in a minute or two.

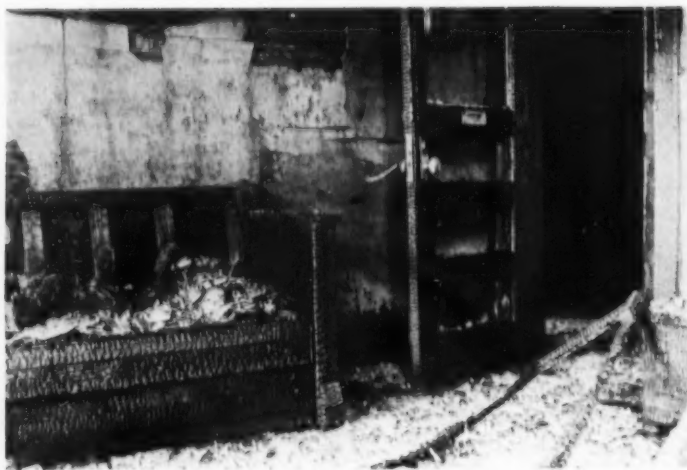


FIREMEN OPEN UP A ROOF TO LET THE PENT-UP HEAT ESCAPE, THUS RETARDING ITS LATERAL SPREAD WHILE OTHER COMPANIES WORK ON THE MAIN BODY OF FIRE. AFTER A BUILDING HAS BEEN "VENTED," MEN CAN GET IN CLOSE TO THE BLAZE AND OPERATE COMPREHENSIVELY—WITHOUT "VENTILATION" AT A GOOD FIRE, THEY'LL BE LUCKY TO STAY ON THE SAME SIDE OF THE STREET WITH IT!

THE MENACE OF THE WOODEN SHINGLE ROOF: SHREVEPORT, LA., AFTER A FIRE LEVELED 196 DWELLINGS IN 1925. THE OUTBREAK STARTED ACROSS THE STREET FROM THE FIRE STATION, BUT SPREAD WITH SUCH RAPIDITY FROM ROOF TO ROOF THAT IT COULDN'T BE CHECKED. THE MENACE OF SHINGLES IS NOT ALONE THAT THEY BURN BUT, MORE IMPORTANT, SEND FLYING BRANDS INTO THE AIR TO BE CARRIED AS FAR AS A MILE WHERE THEY START NEW FIRES.

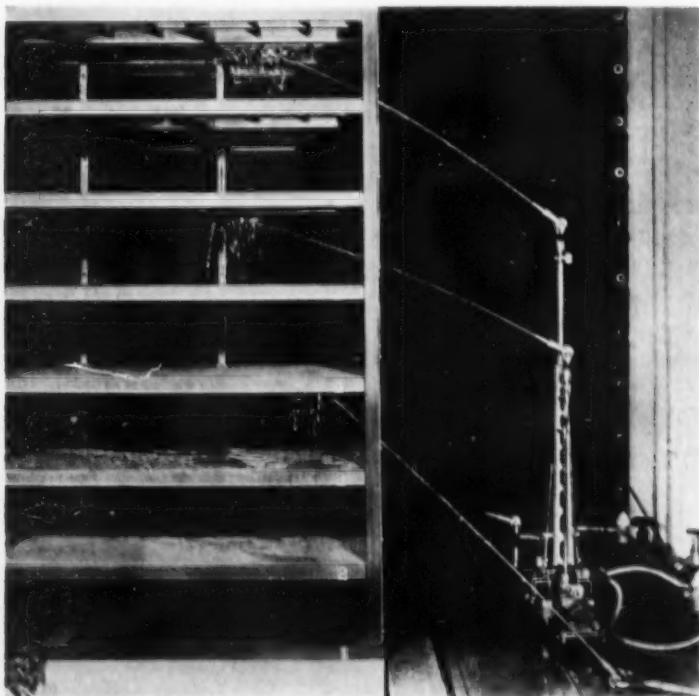






LIGHTWEIGHT DOOR PANELS GAVE FIRE AN ENTRY TO THIS APARTMENT. PENT-UP HEAT IGNITED THE WOOD WHICH BURNED THROUGH QUICKLY. THE APARTMENT WAS GUTTED ALTHOUGH THE ORIGINAL BLAZE WAS THREE FLOORS BELOW. A SOLID DOOR WOULD HAVE MATERIALLY DELAYED THIS ACTION—A FIREPROOFED STAIRWAY WOULD HAVE PREVENTED IT.

SCALE MODEL BY WILLIAM F. CONRAN, NEW YORK, SHOWING LIMITS OF FIRE DEPARTMENT OPERATIONS FROM THE STREET. DISTANCE FROM WINDOW TO 1ST SUPPORTING COLUMN REPRESENTS 10 FEET: FIRE BURNING MORE THAN 10 FEET BACK ON ANY OF THE INDICATED FLOORS WOULD NOT BE TOUCHED BY WATER FROM OUTSIDE BECAUSE NOZZLE ANGLES KILL PENETRATION. THIS IS WHY BELATED DISCOVERY OUTBREAKS PRESENT SUCH A DIFFICULT PROBLEM TO FIREMEN.



**R**everting again to the fireman's viewpoint, his reaction to convection is most simply demonstrated at an ordinary dwelling fire in the city. Even though the smoke is pouring out of the main floor windows, the first truck company in will usually race for the roof to "open up" over the stairway—the principal vertical artery in a residence. The firemen know that in a few seconds more the top floor may be ablaze; and their object is to provide a roof opening through which that pent-up heat can escape harmlessly into the air. This retards the "mushroom" condition or lateral spread; makes the structure more tenable; facilitates rescue and fire fighting. Without that roof opening at a good blaze, a fireman won't get inside the top floor window from the fire escape or ladder: when it has been made, he could comfortably stand in the bedroom door and watch the fire go past him in the hall! The heat is simply going on up instead of horizontally.

Extinguishing operations as such do not interest the architect, but a few points bear mention. Much of the damage at a blaze is done by water because large volumes are required to check a going fire. While estimates vary with the type of fuel, it is moderate to count on 6 to 8 pounds of water for a pound of burning material. It has been calculated that a brick building of combustible interior will contain 19 lb. of combustibles per square foot of floor area, of which 14 lb. are structural elements and the balance trim, decoration, etc. Contents will add 5 lb. more in an apartment or hotel; 10 lb. in an office; more elsewhere. Thus a fire in one 10 by 15 foot bedroom will have a ton of fuel on which to feed: if only half of it is involved, three to four tons of water will be needed to extinguish the blaze. Convert this into terms of a big fire and it becomes clear why buildings with highly absorbent contents so often collapse when those saturated materials expand.

This moderate water delivery applies only under "ideal conditions" which, to the firemen, means getting in on the "fire floor" where they can put the water on the fire. When the heat is too punishing they must keep their distance and, perhaps, operate from outside more or less blindly. Then three-quarters of the water will be wasted because they can't see where it goes and the volume must be proportionately increased.

When firemen have to work from the street, they're beaten. Not only do intervening walls and partitions block the flow of water, but as nozzle angles increase to reach upper floors, penetration is radically diminished.

All of this may appear extraneous yet it serves to establish three fundamentals rarely emphasized in lay fields:

- (1) *A fire spreads with amazing speed when its rising heat has free access to new fuel;*
- (2) *It generates terrific temperatures quickly, necessitating excessive water volume;*
- (3) *Even excessive volume is impotent unless it can be applied in "hand to hand" combat.*

These three elements are definitely related to the architectural factors, fuel and draft. Indeed, they are the basis of every adequate building code no matter how irksome it may seem at times. For, generally speaking, the popular disposition is to leave fire fighting entirely to the firemen whose obstacles are magnified by architects who continue to honeycomb their



structures with *unprotected draft spaces* which convey heat to *new fuel*. This is exactly what converts a burning waste basket into a \$6,000,000 Equitable Building conflagration in 15 minutes. Spread over a wider field, it is the reason why, after twenty years of intensive fire prevention education, our national loss has trebled. Were it not for the fact that we spend twice the fire loss for fire fighting, the annual toll would be much higher!

**T**he remedy is not fire-resistant construction in itself but what might be termed "fire-conscious building." Steel and concrete frames alone do not make structures "fireproof" so long as the unprotected contents are burnable and excessive draft areas prevail. Such buildings simply become giant furnaces, sturdy enough to house a conflagration for hours with obvious results. Of 48 serious outbreaks in fire-resistive buildings, the damage to contents exceeded \$25,000 in 58 per cent of the cases; in six of the fires the total damages amounted to \$1,755,000.

This is no criticism of modern, fire-resistant buildings: it simply means that this fact alone is passive resistance against a very dynamic foe. The war against fire must, rather, be waged on a clear-cut anticipation of its behavior, resulting in plans to forestall that action.

In view of what has already been said, it is obvious that the worst fires are those discovered tardily, for delay is what brings into play the draft and fuel factors. The significance of this is best expressed by the annual experiences which attribute some 65 per cent of the total damages to approximately 1 per cent of the outbreaks.

The solution is two-fold. First, it is essential to reduce the draft areas to minimize the available fuel; second, it is vital to introduce automatic control of one type or another to limit the size of the fire.

The first precept is covered in detail by the Standard Building Code of the National Board of Fire Underwriters which need not be gone into here. The general principle aims at the *isolation* of an outbreak to its point of origin, and the more completely that can be done, the better. Open stairways and shaftways of all types represent the most flagrant hazards: connecting each floor with the next, they make a building one unit so far as rising heat is concerned. Excessive floor areas are another fire spreader, enabling heat which cannot rise to flood an entire floor and ignite its contents, presenting a stiff problem to the firemen who may be summoned a bit late.

Concealed openings are equally vital, and the good code calls for firestopping which will cut off all such draft areas in furred walls, studded-off spaces, partitions, exterior walls, stairs, and the like. Often architects take pains to seal up stairs and shafts, leaving other less obvious spaces unguarded. Ventilating ducts are common flaws in otherwise good buildings, and a good many school fires have become destructive because they were swept into every room via the ventilators. Automatic traps or doors operating on fusible links meet this threat.

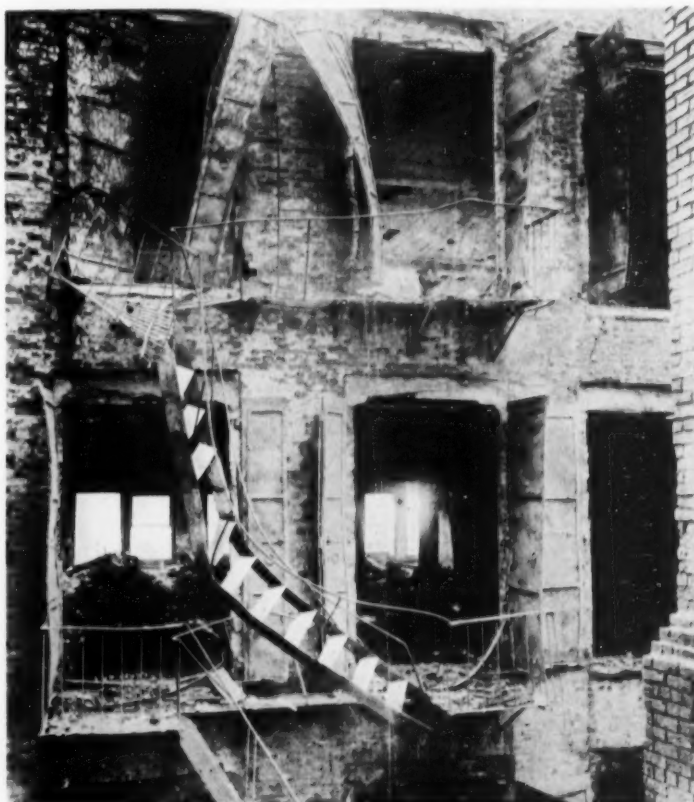
Without actual fire-fighting experience, it is easy to forget that heat will negotiate an opening small enough to discourage an insect. Yet since that is true, any skimping on firestopping and



*Underwood & Underwood*

EFFECT OF INTENSE HEAT ON FIRE-RETARDANT MATERIALS ON THE OUTSIDE OF A BUILDING. CONCRETE MELTED AND DRIPPED OFF COLUMNS INSIDE THIS STRUCTURE. WHEN UNPROTECTED BY AUTOMATIC CONTROL A BUILDING OF THIS TYPE CAN HOLD A RAGING FIRE ANYWHERE FROM 10 HOURS TO SEVERAL DAYS.

OUTSIDE FIRE ESCAPES ARE FINE—UNTIL THE HEAT CONVERTS THEM INTO GRIDDLES! IT TAKES ABOUT 2000° TO DISTORT METAL IN THIS FASHION. THAT IS WHY INSIDE SMOKE-PROOF TOWERS ARE ADVOCATED BY MODERN CODES.





THE REAL "SKYSCRAPER FIRE MENACE" IS FROM THE SMALL ADJOINING BUILDING NOT PROPERLY PROTECTED. THIS BLAZE STARTED IN A 4-STORY FRAME HOTEL; ITS RISING HEAT IGNITED CURTAINS, SHADES AND AWNINGS ON THE 5TH AND 6TH FLOORS OF THE BANK BUILDING AND GUTTED THOSE AND UPPER STORIES BEFORE THE POORLY-EQUIPPED FIRE DEPARTMENT COULD DO ANYTHING ABOUT IT.

cut-offs, especially where that omission can't be detected, is a crime.

So far no particular stress has been laid on the use of incombustible materials for several reasons. When practicable economically, the value of such construction is incontestable and self-convincing. When not practicable economically, argument is pointless. For that reason, this subject of isolating fire in small areas by structural confinements merits all the study and intelligence the architect can bring to it. Where thoroughly applied, this doctrine will render even the combustible building relatively fire safe, hence it has a direct bearing upon the task of rehabilitating an existing structure or building a new one outside of a city's fire limits. Perhaps the outstanding exception to this theory involves roofing, especially of dwellings. The popular wooden shingle roof accounts for a direct property loss of over \$16,000,000 annually due to "sparks on roof." In many cities wooden roof fires account for 40 to more than 50 per cent of all the fire department's runs, and on a single day in Indianapolis 67 alarms out of 68 were for shingle roof fires.

In addition to these smaller blazes there have been 22 major conflagrations since 1900, aggregating \$95,000,000 in damages, directly due to the ability of these roofs to spread fire from house to house. Consequently, the subject of roofing falls outside of mere economic into the field of public welfare.

Apart from this, incombustible materials play their strongest rôles in the existing building as firestops for the sealing of draft spaces, vertical arteries, and the like. Yet even here they must be employed with intelligence else their purpose will be defeated. They must do more than refuse to burn: they must keep the heat from passing, and that calls for sensible installation. A good-grade plaster ceiling won't burn in the accepted sense, but if it is laid on wooden lath, it can transmit heat enough to ignite the lath. Indeed, an unburnable asbestos ceiling can accomplish the same treachery if the proper air space isn't provided behind it or its base composed of incombustible supports, too. Those who criticize certain code requirements as being too stringent have never seen a fire conveyed through an apparently sturdy wall to ignite the adjoining room!

From the opposite angle, the unintelligent use of incombustibles often proves a hazard rather than a help. Bare steel or cast iron supporting columns, to cite a single case, are the bugbear of firemen in the old building where intense heat will weaken them or cold water crack them. It was demonstrated years ago that bare, structural steel would fail under genuine fire conditions in from eleven to twenty-one minutes; when reinforced with 4-inch stone concrete, similar columns stood up seven to eight hours.

**T**he first fundamental of fire control then, in new structure or old, is isolation. The ideal is to break up a building into units as far as possible, each unit being capable of holding an outbreak within its confine for at least an hour. The nearer we approach that objective, the safer the combustible building will be from the dread menace of a quick-spreading blaze.

The second step, which becomes more vital "as the square of the impracticability" of the first, is automatic control. The firemen say "the first five minutes are worth the next five hours,"

and that maxim tells the whole story of mechanical protection in ten words. The bad fires—the 1 per cent that cause 65 per cent of the losses—are fires in which the first five minutes or more were wasted. In most instances they are night-time outbreaks, discovered accidentally by a passer-by—which means that the building is doomed before the firemen arrive. The only remedy is some provision for early discovery and prompt action, and this may take either of two forms:

A. The supervised automatic sprinkler system;

B. The approved fire detection system.

Automatic sprinklers need no elaboration here: for 35 years or more they have proved effective in 98 per cent of the demands made upon them. What does bear mention is the fact that their occasional failure is generally due to the collapse of the human element: gate valves have been closed; water pressure has been allowed to drop; steam in the boilers is low, or what-not. The lesson from these cruel experiences is simple: the best sprinkler system is one electrically supervised through an outside central station, for then the fickle human element is virtually eliminated.

Recalling earlier references to temperatures created and water volumes required in a real fire, the value of the automatic sprinkler beggars debate. Operating, usually, at approximately the melting point of wax, sprinklers extinguish 60 per cent of their fires with the operation of but one to three heads giving a shower of water rather than a deluge.

For architects chiefly concerned with residential construction, this ally is now feasible at very nominal costs for at least partial protection. The domestic cellar sprinkler recently made available by several manufacturers ranges in price from \$65 to \$150 and can be extended to the first floor. The house water supply is employed, obviating the need for roof tanks, and the installation can be made by any competent plumber. Since about three-quarters of our dwelling outbreaks originate in the cellar, this area is a vital one.

**C**onsidering regulation sprinklers however, there are many occupancies in which an immediate water flow is not advisable because of the nature of contents or where complete installations would prove too costly. Here the automatic detection system supplants the sprinkler to good purpose, giving an early alarm which will bring prompt action.

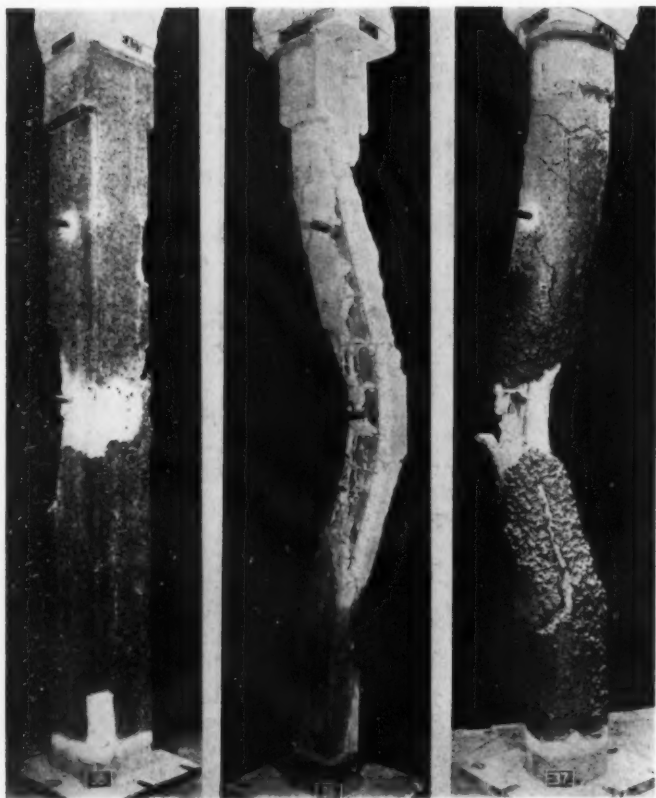
The most widely used devices fall into two classes: thermostatic and pneumatic. The former employs either spot thermostats or, better yet, continuous "fire wire" which is sensitive to heat. The expansion or fusing of these detectors either closes or opens a circuit which transmits an alarm. The pneumatic type employs continuous copper wire containing air at "room pressure." Heat causes this air to expand and escape forcefully from fixed vents, thus bulging a diaphragm and closing an electrical circuit.

The distinction is that the thermostatic systems work at a fixed temperature—usually 150°—while the latter uses the "rate of rise" principle which usually spells quicker action. Ordinarily, the rate of rise device will operate upon a jump of 20° in room temperature within the period of a minute since it is tuned to report a *quick rise* in temperature rather than to wait for a predetermined mark to be attained.

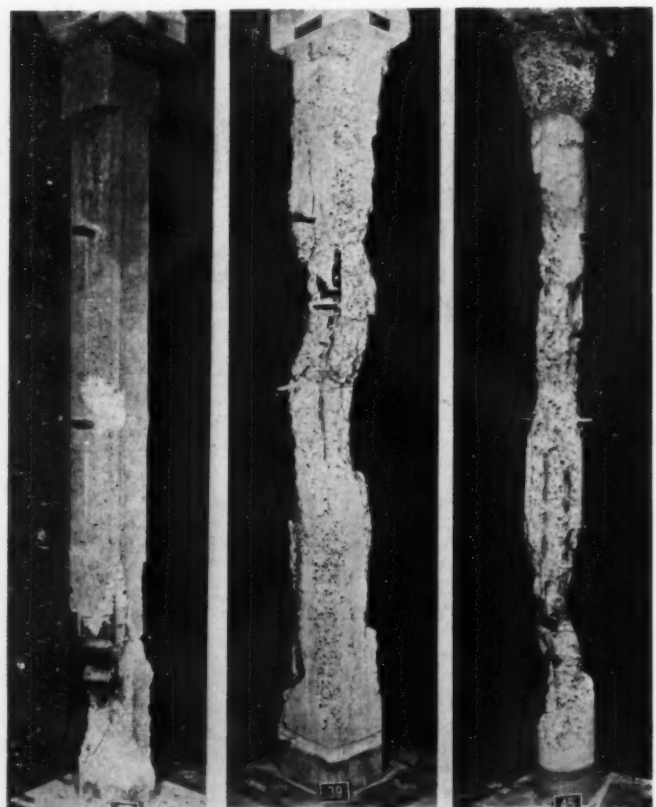


A HOT FIRE — LARGE VOLUMES OF WATER — ABSORBENT CONTENTS—BUILDING COLLAPSES. THIS 6-STORY BUILDING DIDN'T BURN DOWN: IT FELL DOWN WHEN ITS BALED PAPER AND RAGS SWELLED WITH WATER AND PUSHED OUT THE WALLS.





RESULTS OF FIRE TESTS OF COLUMNS PROTECTED BY PLASTER ON METAL LATH. THE PROTECTION WAS APPLIED AS A SINGLE LAYER OR IN DOUBLE LAYER WITH AN AIR SPACE BETWEEN LAYERS, THE PROTECTION AFFORDED BY THE TWO TYPES OF COVERING BEING ONE HOUR AND TWO HOURS RESPECTIVELY, WHEN THE COLUMNS WERE CARRYING THEIR FULL WORKING LOAD.



U. S. Bureau of Standards

Aside from merely transmitting an alarm, automatic systems can perform other emergency services in addition. In certain occupancies they operate chemical tipping systems to flood an area with extinguishing gas; they can be employed to switch on emergency lights on stairs and halls; illuminate exit signs which will direct occupants away from the fire area to unobstructed stairways; close fire doors and windows; shut off motors and fans; and perform numerous other useful acts which might be forgotten by excited humans. One system, especially designed for school use, broadcasts the alarm through amplifiers in the form of a bugle call, gives verbal instructions for the egress, and then plays a rousing piece of band music to facilitate the exit march.

As with sprinklers, supervision again becomes vital, for the system which has become inoperative is worse than none at all. Approved detectors are self-supervisory: i.e., their own circuits continuously check up on the system and give a trouble signal when anything goes wrong. With such a system, silence is the perfect guarantee of workability—with others, silence is at best dubious.

Where central station tie-ups or direct fire department connections in the approved manner are possible, the automatic detector becomes indispensable for two salient reasons. The first is that professional supervision is always at hand; the second is that professional help is immediately forthcoming upon receipt of an alarm. The second factor meets the constant flaw of the "local" system—the fact that nobody may be around to hear it when it goes off—or that those who hear it may be so inexperienced or become so excited that they fail to do the right thing.

In general terms, then, automatic control is the body blow that really hurts fire. It eliminates that costly curse of belated discovery with the destructive train of events following in its wake. And, dollar for dollar, it affords more genuine protection to the average building than any other investment can. This doesn't imply that sensible construction is to be ignored for automatic devices: in some measure they go hand in hand. The best of mechanical devices can fail under adverse conditions—the flash fire, for instance, in vapors or dusts which gets out of control in a split second; the explosion, likewise, which may not only scatter a large body of fire instantaneously but which may also cripple the automatic system.

Such ever-present possibilities simply emphasize the fact that the burden of fire safety can never be placed entirely upon any single element. Yet granting that, it is still patent that approved automatic control can take a lion's share of the job. In the old building where the most generous reconstruction plans will be severely limited, the automatic system will be extremely vital, not to say extremely economical, in the effort to control fire. And in the ultra-modern fire-resistant structure, packed with thousands of tons of combustible contents, it is the one factor which can really prevent that building from being turned into a twenty-story furnace!

The cheaper way is control rather than combat. And control comes right back to the architect who has it in his power to put up buildings so equipped that an outbreak can be localized, that its heat can be confined to a small unit instead of sweeping through the whole structure to new fuel, that its possible outbreak can be reported in its infancy and killed with dispatch.



# PORTFOLIO

MODERNIZATION AND ALTERATION





VIEW OF LIVING ROOM

APARTMENT OF  
JOHN ATKINSON DUNBAR,  
NEW YORK CITY

WILLIAM MUSCHENHEIM, ARCHITECT

LIVING ROOM (Above)

FURNITURE: ZEBRA WOOD.

UPHOLSTERY: RUST COLOR, ROYAL BLUE AND SULPHUR YELLOW.

WALLS AND CEILING: ALL WHITE.

NATURAL COLOR HAIR CARPET ON FLOOR WITH HEAVY PILE BLUE RUG.

LIBRARY (Preceding Page)

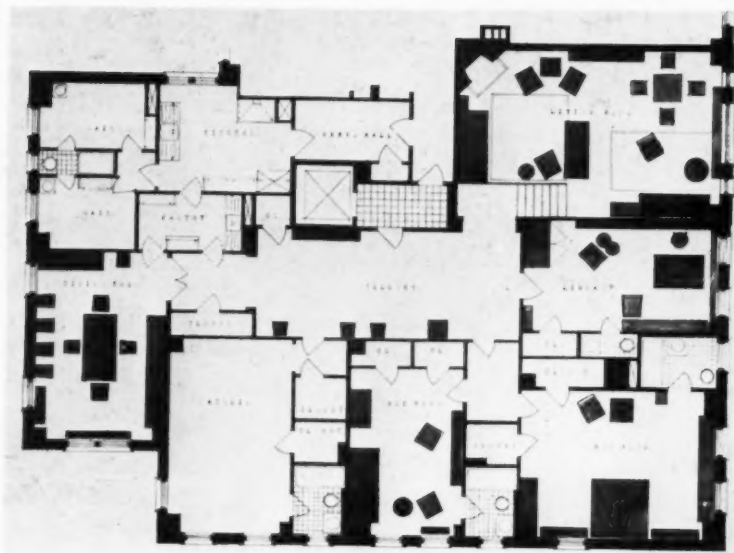
BOOKCASES AND DESK: BRAZILIAN ROSEWOOD.

DESK TOP AND UPHOLSTERED CHAIRS OF PIGSKIN.

WALLS AND CEILING PAINTED BATTLESHIP GRAY FLAT.

HEAVY PILE YELLOW CARPET.

DESK CONTAINS TYPEWRITER, TELEPHONE, FILING CABINET AND HUMIDOR.



PLAN OF THE APARTMENT

#### BEDROOM

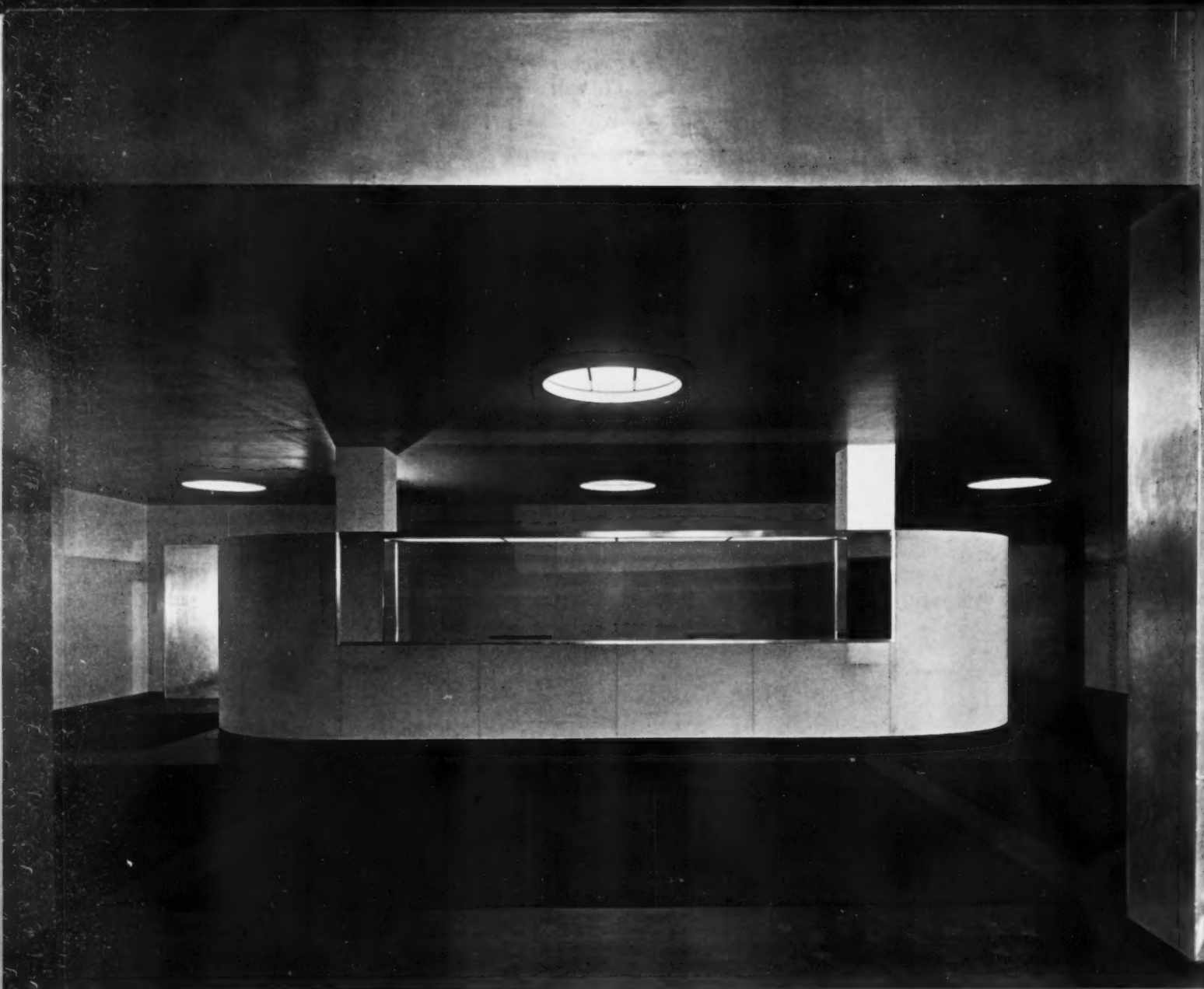
FURNITURE PAINTED YELLOW.  
WALLS AND CEILING: WHITE.  
WIENER WERKSTAETTE WALLPAPER: YELLOW AND GREEN-BLUE.  
COVERING ON BEDS: GREEN-BLUE.  
GRAY CARPET.  
GRAY WALL PANEL: CELOTEX UNDERNEATH FOR TACKING PICTURES.  
ORANGE CUSHIONS ON TUBULAR CHAIRS AND WINDOW SEAT.  
BLACK GLASS TABLE TOP.

#### BEDROOM



Byron Co.





Iron Co.

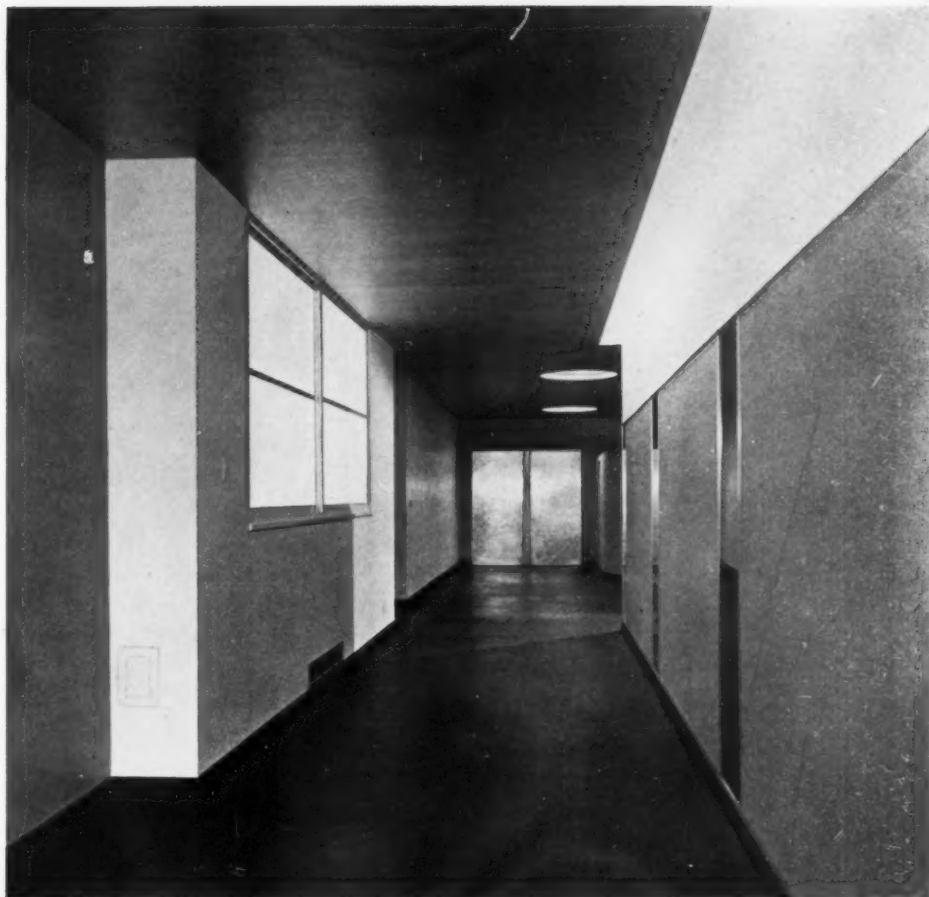
CHECKING COUNTER

BALLROOM FOYER AND COATROOM  
HOTEL ASTOR, NEW YORK CITY

WILLIAM MUSCHENHEIM, ARCHITECT

CHECKING COUNTER OF COATROOM: MIRRORS WITH  
REFLECTOR ABOVE.  
WALLS OF INCLOSURE: PALE YELLOW.  
WALL IN BACK OF INCLOSURE: VERMILION.  
ALUMINUM DOORS.  
CEILING PAINTED ALUMINUM, OTHER WALLS WHITE.  
WALLS OF THE NARROW PASSAGE: BLACK LINOLEUM  
WITH HORIZONTAL STRIPS OF MIRROR.

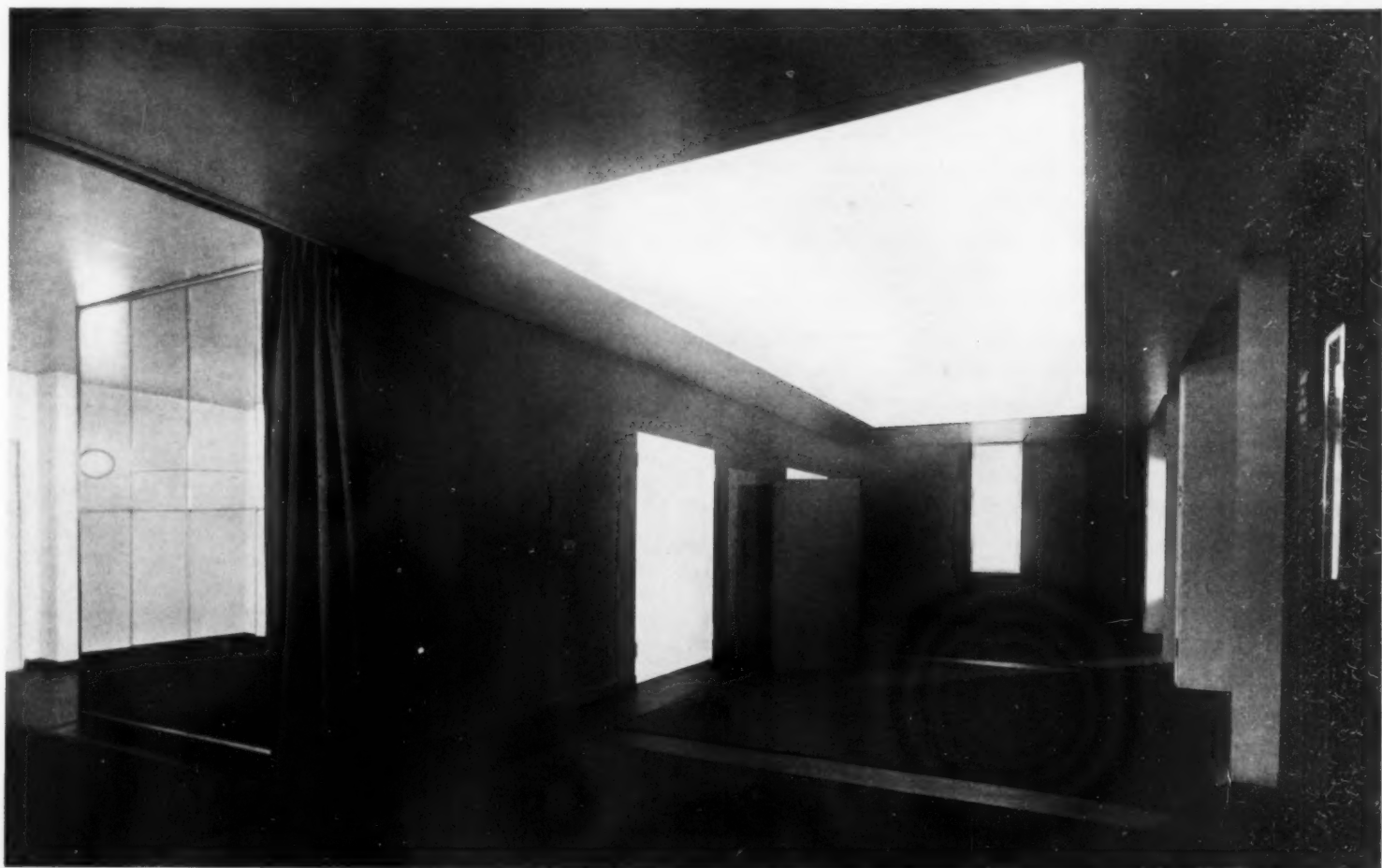




PASSAGE TO FOYER

*Byron Co.*

HALLWAY





Samuel H. Gottscho

## NEW YORK OPHTHALMIC HOSPITAL, 415 EAST 63RD

The buildings remodeled for the new clinic were formerly occupied as tenement houses. Floors were reinforced with steel girders to carry a live load of 100 pounds per square foot. All existing windows in all clinic spaces were removed and replaced with steel casement sash. A new interior fireproof stairway was installed. The wood floors were covered with composition tile. Walls and ceilings were newly plastered. New plumbing, heating and electrical work were installed. The building was newly decorated inside from top to bottom.

For lack of funds, very little was done to the exterior. The appearance of the front was improved by removing existing basement windows and bricking up the openings. New entrance steps were built with a wrought iron balustrade on each side and a new wrought iron entrance gate. The entire front of the building was given two coats of paint.

The operation is an example of the current trend to capitalize the economic value of obsolete buildings by altering them for an entirely different use. Remodeling and modernization, therefore, offer a practical method of expansion for hospitals until money is again available for new buildings.

The entire cost of the alterations, exclusive of furnishings, but including architect's fee, approximated \$27,000.

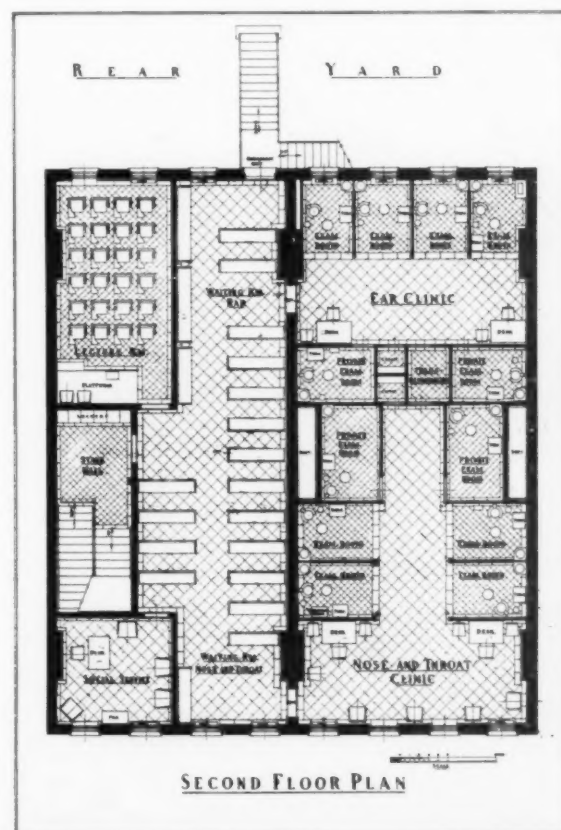
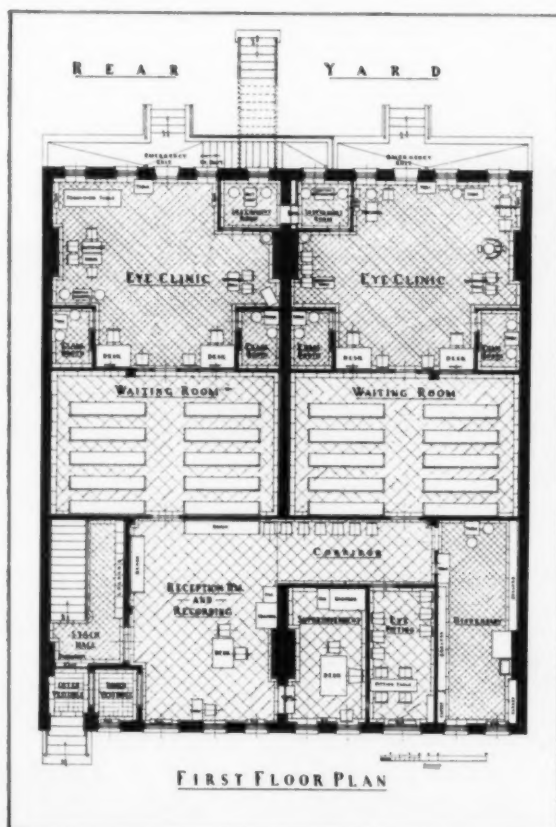




Samuel H. Gottscho

STREET, NEW YORK CITY

CHARLES H. LENCH, ARCHITECT





APARTMENT AT 2 BEEKMAN PLACE, NEW YORK CITY  
EUGENE SCHOEN & SONS, ARCHITECTS



BEDROOM

WALLS PAINTED LIGHT GREEN.

CARPET: DARK BOTTLE GREEN.

FABRIC ON WALL: METROPA IN SEVERAL SHADES OF GREEN AND YELLOW.

FURNITURE: AMERICAN MAPLE AND BRAZILIAN ROSEWOOD.





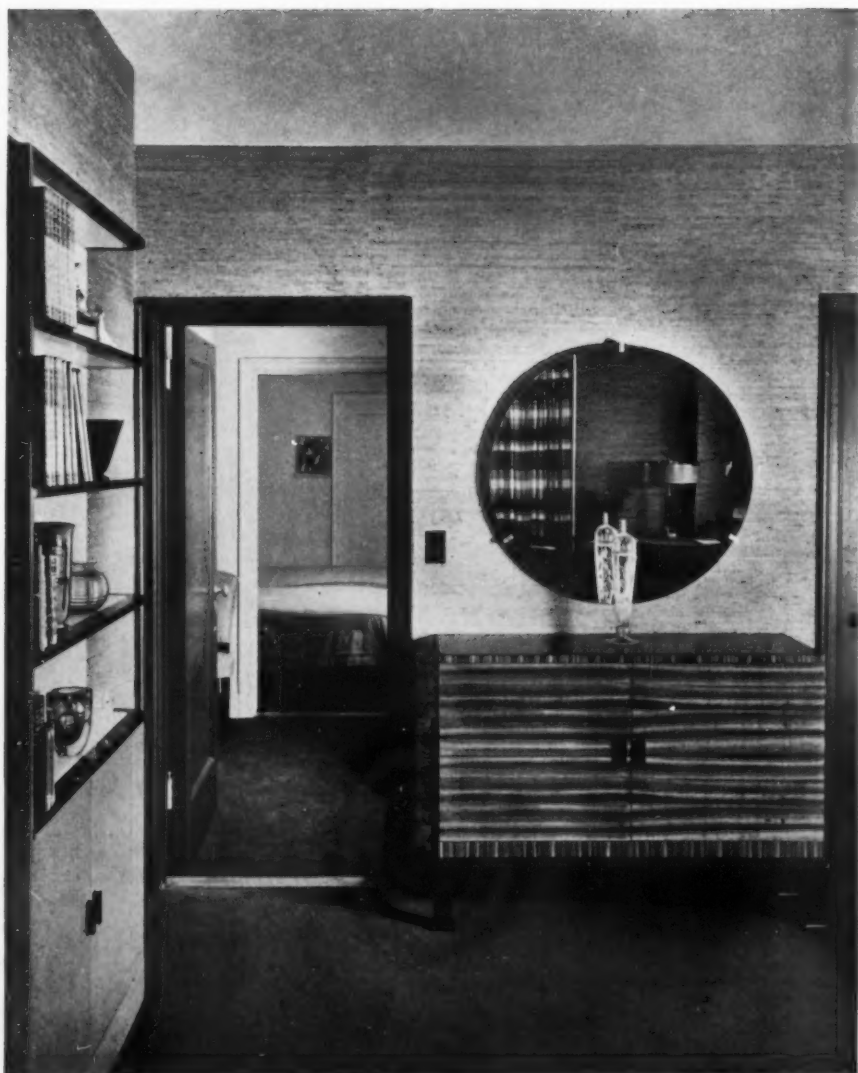
*F. S. Lincoln*

### DINING ROOM

WALLS PAPERED IN SALUBRA.

FLOOR: BLACK CARPET.

FURNITURE: EUROPEAN CHERRY AND AFRICAN  
CHERRY TRIM; WHITE LEATHER COVERING.  
WHITE WOVEN DRAPERY.



*F. S. Lincoln*

#### STUDY

WALLS: JAPANESE GRASS CLOTH.

CARPET: OLIVE GREEN.

FURNITURE: FRENCH STRIPED SATINE AND  
EAST INDIAN ROSEWOOD.

TRIM: RED.

### APARTMENT AT 2 BEEKMAN PLACE, NEW YORK CITY

EUGENE SCHOEN & SONS, ARCHITECTS



BUILT-IN FURNITURE: YUBA WOOD WITH DARK BROWN LACQUER BASES.

DRAWER PULLS: POLISHED ALUMINUM AND DARK BROWN CATALIN.

THE FURNITURE PIECES ARE INDIVIDUAL AND CAN BE USED IN OTHER ROOMS IN DIFFERENT COMBINATIONS.

SOFA DESIGNED TO BE USED AS A BED WITH REMOVABLE BACK.

SMALL TABLE AND LAMPS: FORMICA AND ALUMINUM.

CEILING FIXTURE: DIRECT DOWN LIGHT THROUGH ETCHED FLASH OPAL GLASS.

COLOR SCHEME RANGES FROM CHOCOLATE BROWN WALLS TO WHITE OR LIGHT CREAM WOODWORK.

CARPET: VERY LIGHT BEIGE.

CEILING: CORRESPONDING COLOR.

CURTAINS: WHITE, ROUGH TEXTURED FABRIC, FLANKING WHITE VENETIAN BLINDS WITH DARK BROWN TAPES.

LARGE ROUND BACK CHAIR IN FRONT OF WINDOW: CREAM COLOR CRUSHED PILE FABRIC.

SOFA: HORIZONTAL STRIPES OF BEIGE, RED, AND BROWN.

DESK CHAIR: SAME COLORS IN A CHECKED MATERIAL.

## APARTMENT OF WILLIAM ROSENFELD, CHICAGO

DONALD DESKEY, DESIGNER



*Hedrich-Blessing*



*Hedrich-Blessing*

## EDGEWATER BEACH APARTMENTS, CHICAGO

APARTMENT SUITE DESIGNED AND OCCUPIED  
BY MR. AND MRS. A. S. KIRKEBY

WALLS: CHALK WHITE.

FLOORS: ENAMELED BLACK AND CARPETED  
WITH SEAMLOC IN SPANISH TILE COLOR.

WINDOWS: BLACK VENETIAN BLINDS; WHITE  
TAPE AND WHITE COTTON CORD.

CARD TABLE: CHROMIUM TUBES, WASHABLE  
FABRIKOID UPHOLSTERY, LEMON COLOR.

END TABLES: VITROLITE TOPS.





*Hedrich-Blessing*

REMODELED APARTMENT INTERIOR  
HOTEL SHORELAND, CHICAGO  
J. R. DAVIDSON, DESIGNER

One salient point of the problem, in remodeling the interiors of this residential hotel, was to obtain individual treatment in each room, but at the same time to design the various units in such a way that they would be interchangeable and would fit the different floor plans of other apartments in the hotel. Consequently, the remodeled and the few newly-built pieces were designed in small units.



REMODELED APARTMENT INTERIOR  
HOTEL SHORELAND, CHICAGO  
J. R. DAVIDSON, DESIGNER

INTERIOR

*Hedrich-Blessing*

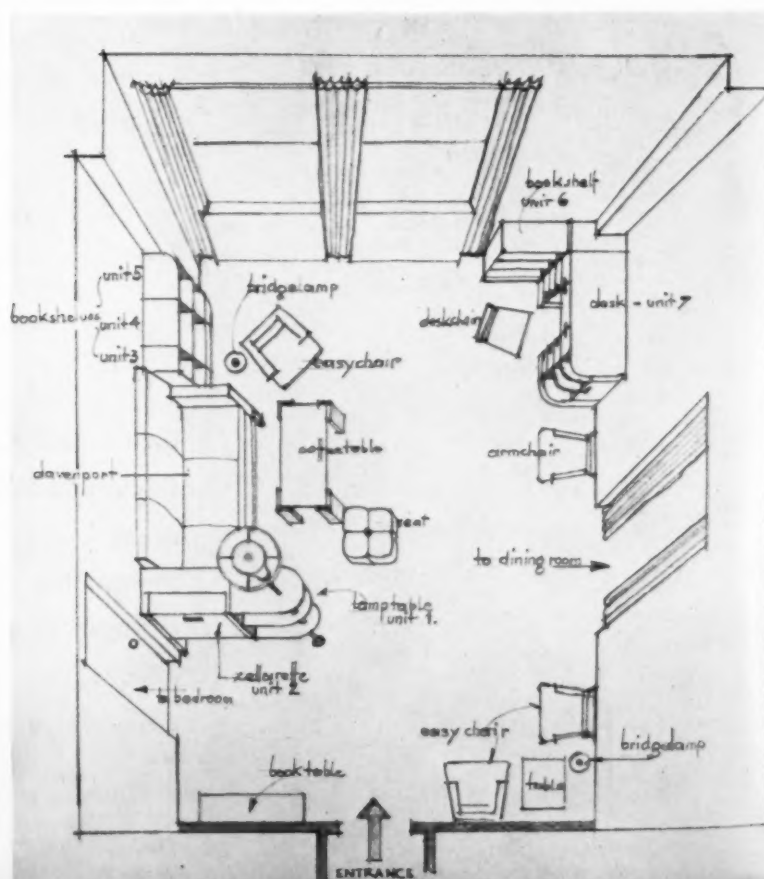
PERSPECTIVE PLAN

COLOR SCHEME: VERY DARK MULBERRY CARPET;  
WHITE WALLS AND CEILING; LIGHT BEIGE HANG-  
INGS.

COVERINGS: PLAIN, GOLD-BROWN; BEIGE, CORAL,  
AND BROWN STRIPED; PLAIN ABSINTHE YELLOW.  
WOOD: WALNUT (NATURAL FINISH).

HARDWARE AND LIGHT FIXTURES: CHROME WITH  
IVORY CATALIN; PLAIN PARCHMENT.

DAVENPORT, CHAIRS AND WRITING DESK ARE RE-  
MODELED OLD PIECES. BRIDGE LAMP AND DESK  
LAMP, BOUGHT FROM STOCK OF LAMP FACTORY.  
BOOKSHELVES AND CELLARETTE NEWLY CON-  
STRUCTED.





Hedrich-Blessing

ALCOVE IN THE BAR AND COCKTAIL ROOM

## BAR AND COCKTAIL ROOM, HOTEL SHORELAND, CHICAGO

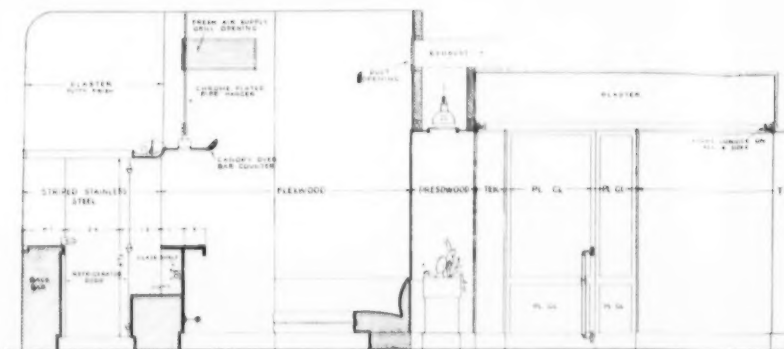
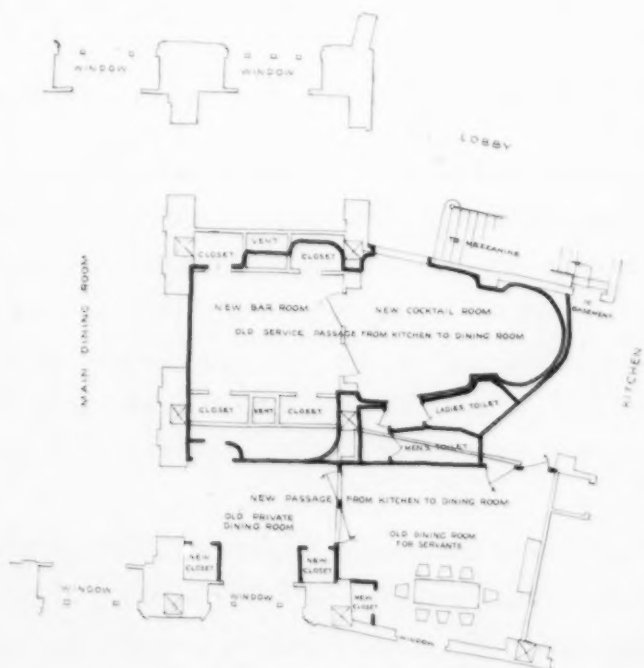
J. R. DAVIDSON  
DESIGNER

As the bar naturally had to be near the main dining room, preferably directly in front so that guests could stop for an apéritif before or a digestive after dinner, only a very small space, the pantry and service passage from kitchen to dining room, was available (see plan on page 518, also plan on back of frontispiece). A small private dining room and a kitchen officers' dining room were opened up as the new pantry and service passage.

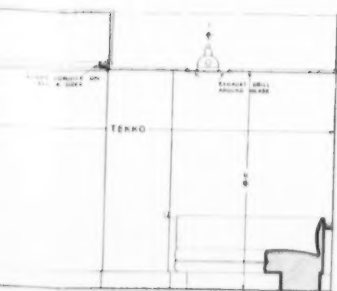
Advantage was taken of the peculiar angles and different ceiling heights of this incidental space in creating a feeling of spaciousness. Colors and artificial light effects were used to a large extent to attain this end.

## ✓

FLOOR COVERING: THREE TONES OF BROWN VELOUR CARPET, EXCEPT THE BROWN LINOLEUM IN FRONT OF BAR.  
WALLS IN COCKTAIL LOUNGE: PALE GOLD TEKKO.  
CEILING: LIGHT CORAL.  
WALLS IN BAR ROOM: ZEBRA-FLEXWOOD.  
WALLS BACK OF BAR COUNTER: LOWER PART, STRIPED, ETCHED, STAINLESS STEEL, GLASS AND LACQUERED WOOD; UPPER PART, -LIGHT YELLOW.  
ENTIRE CEILING: LIGHT YELLOW.  
BAR COUNTER: BLUE FRONT, BLACK EBONIZED MAHOGANY TOP, STAINLESS STEEL BACK.  
BLUE CANOPY OVER BAR.  
BLUE LIGHT BACK OF THREE-ETCHED GLASS PANELS IN BACK OF BAR.  
CIRCULAR BENCH; FLAME-COLORED FRIEZE.  
TWO STRAIGHT SEATS AND ALL CHAIRS: CHROME METAL, TWO-TONE BLUE FABRIKOID.  
TWO CORNER SEATS: PLAIN BLUE FABRIKOID.  
BAR STOOLS: FLAME-COLORED FABRIKOID.  
ALL TABLES: CHROME METAL BASE AND BLACK GLOSSY FORMICA TOP.  
LIGHTING: ENTIRELY INDIRECT—IN COCKTAIL LOUNGE AND BACK OF CIRCULAR SEAT, A CONTINUOUS LIGHT TROUGH, REFLECTING ON CEILING; IN BAR ROOM, CONCEALED IN CANOPY, SUSPENDED ON CHROME-METAL HANGERS. ALSO BUILT-IN SPOTLIGHTS, THROWING LIGHT DOWN INTO DRINKS SERVED ON COUNTER.







SECTION THROUGH THE BAR  
AND COCKTAIL ROOM

THE HOTEL SHORELAND BAR—J. R. DAVIDSON, DESIGNER.

*Hedrich-Blessing*





*Hedrich-Blessing*

BAR ROOM IN THE SENECA HOTEL, CHICAGO  
LOUIS R. SOLOMON AND ASSOCIATES, DESIGNERS



BAR: MARINE BLUE, BLACK AND SILVER.  
FURNITURE: NATURAL WOOD UPHOLSTERED IN BLUE  
LEATHER.

GRANADA CAFE, CHICAGO  
GORDON GUNDLING, DESIGNER

The bar was built to meet existing conditions in the lounge.

CONSTRUCTION: BLACK FORMICA AND CHROME STRIPS, WITH BLACK FORMICA BAR TOP.

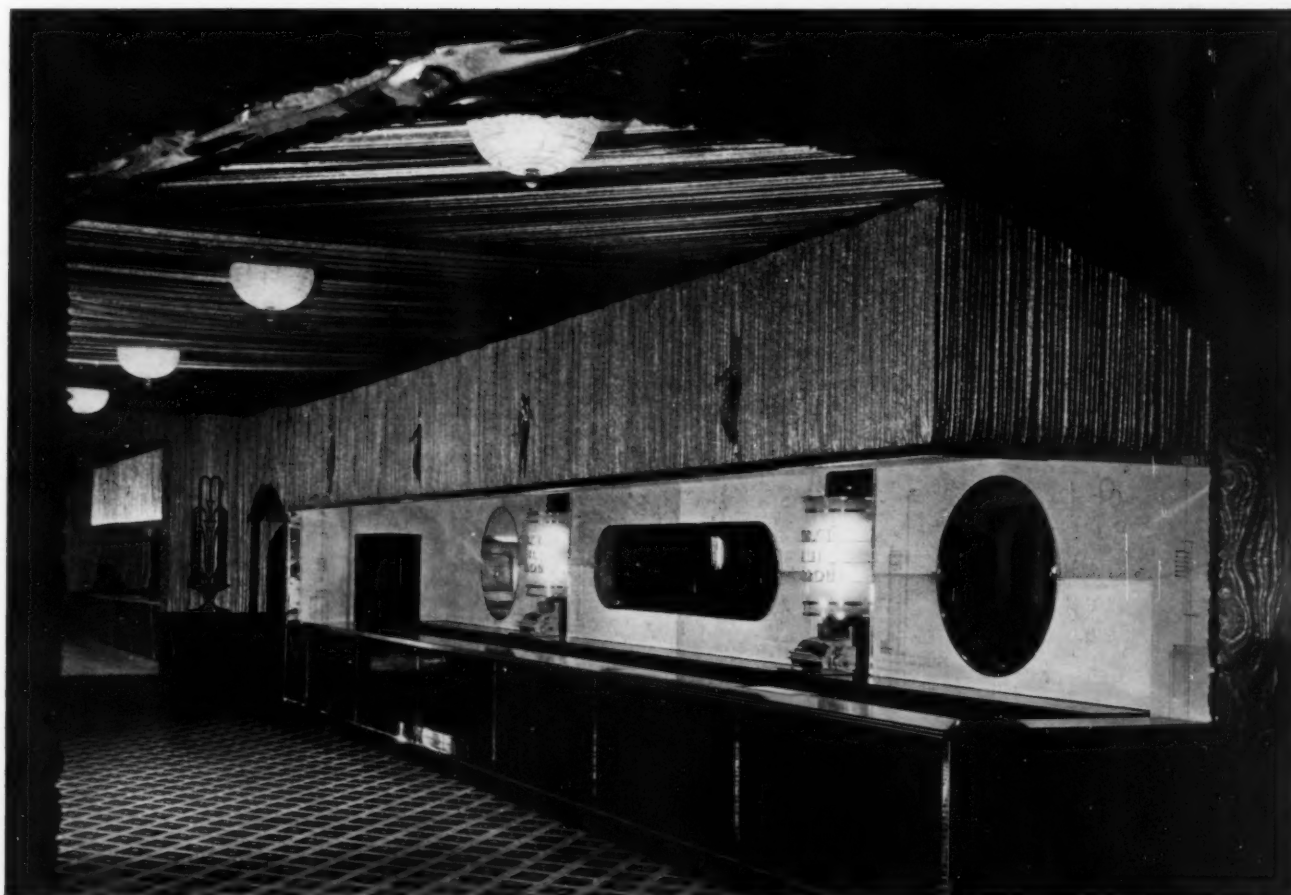
BACK BAR COUNTERS FINISHED IN BLACK FORMICA.

CHROME-PLATED CASH REGISTERS. AT BACK OF EACH CASH REGISTER IS A BLACK FORMICA PANEL RUNNING TO THE CEILING OF THE CANOPY, WITH A HALF CYLINDER OF OPAL GLASS AND METAL LETTERS ON BANDS. ON THE BACK BAR WALL THREE MIRRORS ARE SET IN CHROME FRAMES.

LIGHTING: A SERIES OF FLOODLIGHTS IN THE CANOPY CEILING.

CANOPY: GOLD MATERIAL WITH GOLD FIGURES AFFIXED; THESE FIGURES ARE ILLUMINATED BY PIN SPOTLIGHTS ON THE OPPOSITE SIDE OF THE ROOM.

COLOR SCHEME OF THE BACK WALL: TWO-TONE PEACH COLOR WITH SALMON COLOR AIR-BRUSH WORK.



*Hedrich-Blessing*

SHOP INTERIOR



Hedrich-Blessing

SHOP ENTRANCE

## BARNETT'S MILLINERY, CHICAGO

GORDON GUNDLING, DESIGNER

STORE FRONT EXTERIOR: BLACK VITROLITE AND CHROME METAL.  
WINDOW BACKGROUNDS: METAL LATH AND PLASTER TRIMMED  
WITH POLISHED ALUMINUM IN IVORY AND TERRA COTTA RED.

STORE INTERIOR: IVORY AND TERRA COTTA RED.

COLUMNS: TERRA COTTA RED STRIPED IN GOLD.

WALLS: IVORY WITH TERRA COTTA RED AIR-BRUSH WORK.

HAT STANDARDS: SIX RACKS MOUNTED ON ONE CHROME CHANNEL.

AT EACH MIRROR A VANITY TABLE IS SUPPORTED ON POLISHED  
ALUMINUM TUBES COMING FROM THE WALLS.

CEILING: WHITE.

FLOOR: BLACK WITH IVORY FEATURE STRIP.

CHAIRS UPHOLSTERED IN CHARTREUSE GREEN.







VIEW TOWARD ENTRANCE

*Hedrich-Blessing*

BARNETT'S DRESS SHOP, CHICAGO GORDON GUNDLING, DESIGNER

The shop is of stud construction finished with plaster board and Masonite. Millwork dress cases are built in. The plan has three sections: (1) a dress salon, (2) fitting rooms and cashier, and (3) the rear section, a coat and suit salon.

COLOR SCHEME: ROSE, IVORY, AND CHARTREUSE GREEN STRIPED IN GOLD.  
CARPET: BURGUNDY RED.  
FURNITURE: SALMON COLOR AND CHARTREUSE GREEN LEATHERETTE.

VIEW TOWARD REAR

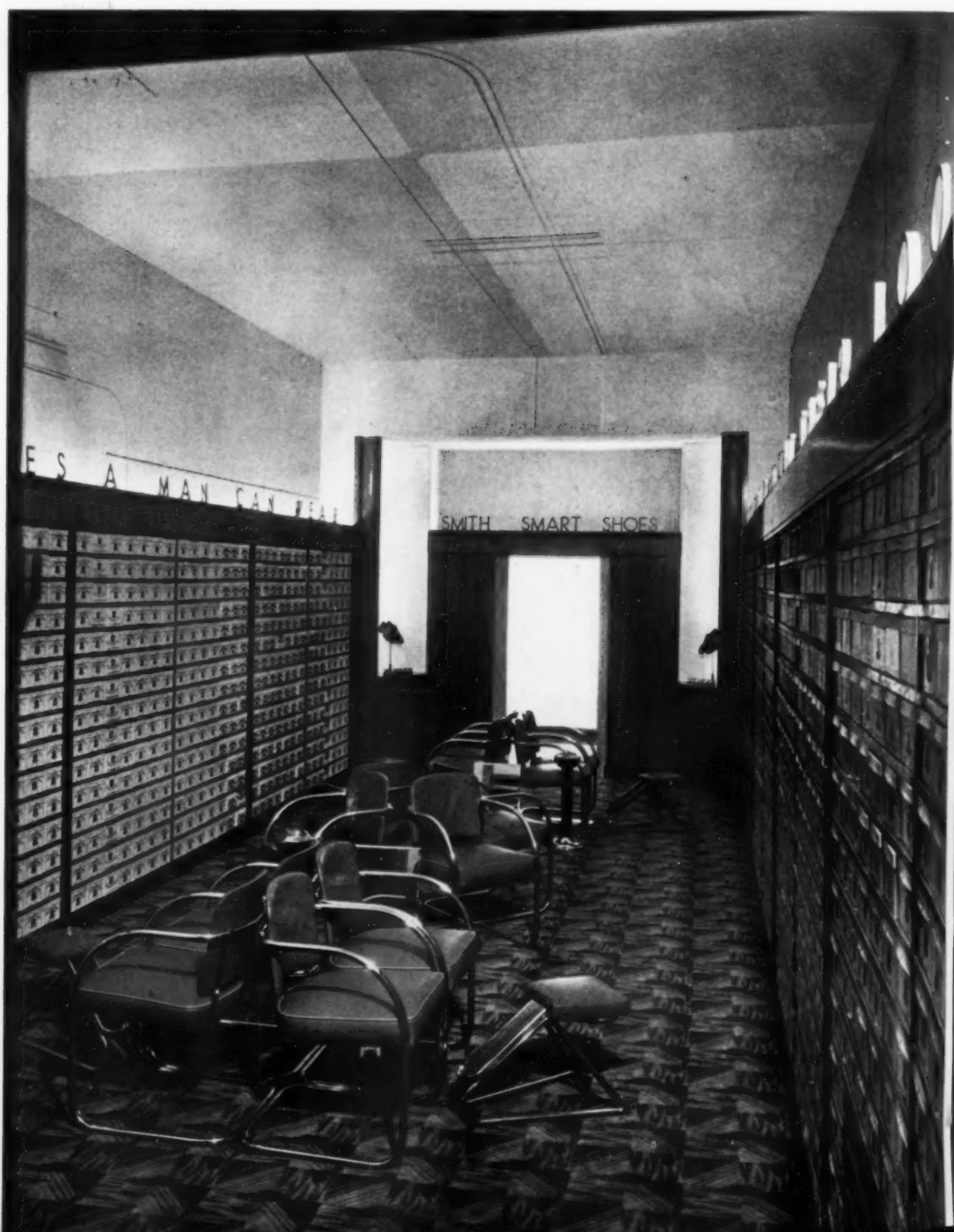




*Hedrich-Blessing*

SMITH SHOE SHOP  
CHICAGO  
GORDON GUNDLING  
DESIGNER

WINDOW BULKHEAD: BLACK GRANITE.  
ALL STORE FRONT METAL: EXTRUDED BRONZE.  
WINDOW BACKGROUNDS: CHOCOLATE BROWN AND  
TONES OF LIGHTER BROWNS AND IVORY STRIPED  
IN GOLD AND BROWN.  
SHOE CASES: AMERICAN BLACK WALNUT.  
LIGHTING: INDIRECT TO ILLUMINATE THE CEILING.  
CHROME CHAIRS: POLISHED IN A CINNAMON  
BROWN.  
CARPET: SOFT SHADES OF SEPIA BROWN AND  
BURNT ORANGE.  
CEILING AND WALLS: LIGHT YELLOW AND CREAM  
COLOR STRIPED IN ORANGE AND DEEP YELLOW.





*Morris Rosenfeld*

AFTER

21-24 STATE STREET

BEFORE



## TWO REMODELED ELEVATOR LOBBIES

DESIGNED BY R. M. KARGER, CITIES SERVICE COMPANY, NEW YORK CITY

MOSAIC TILE FLOORING WAS REMOVED AND NEW BLACK TERRAZZO WITH WIDE WHITE METAL STRIPS INSTALLED.

NEW LIGHTING FIXTURES: WHITE METAL FINISH WITH FLASHED OPAL GLASS.

EXPOSED RADIATORS EITHER CONCEALED IN MARBLE OR ALUMINUM ENCLOSURES OR NEW PRESSURE SYSTEMS INSTALLED BEHIND ALUMINUM GRILLES.

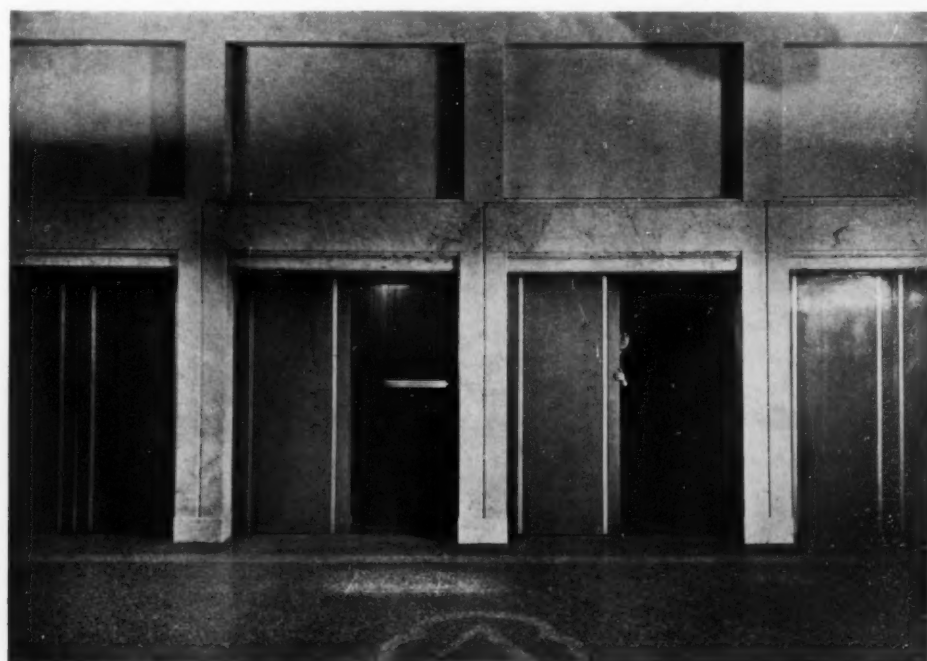
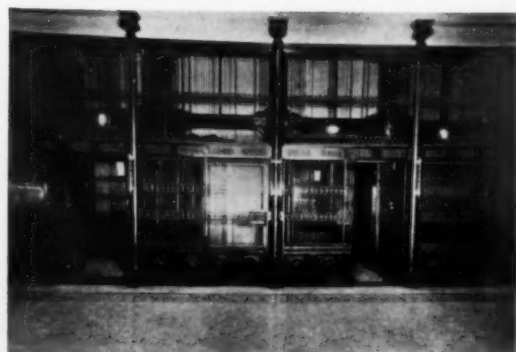
NEW ENTRANCE AND VESTIBULE DOORS OF THE BALANCED TYPE INSTALLED WITH NEW SCREENS.

DOORS AND METAL PARTS OF SCREENS: STEEL WITH BAKED ENAMEL FINISH; ALUMINUM HANDLES AND KICK PLATES.

AFTER

8-10 BRIDGE STREET

BEFORE



*Morris Rosenfeld*





*Van Ande*  
WEST APPROACH AFTER ALTERATION

HOUSE OF MRS. JOHN ERSKINE, WILTON, CONNECTICUT  
EVANS, MOORE & WOODBRIDGE, ARCHITECTS

The original house was a small frame farmhouse about 80 years old with simple Greek revival details. The owner is fond of native stone work which was used for the additions. The original house had a dull weather-beaten color which was kept for new woodwork blending into the tones of the field stone. The new roof is of rough-textured greenish gray slate. The entire main portion of the original house was converted into a living room, retaining old woodwork and exposed timbers. For the dining room walls, paneling was made out of oak flooring from the original attic.

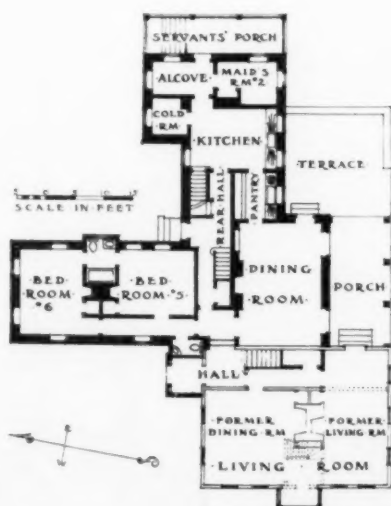




Van Ande  
NORTH ELEVATION AFTER ALTERATIONS



WEST ELEVATION BEFORE  
ALTERATIONS

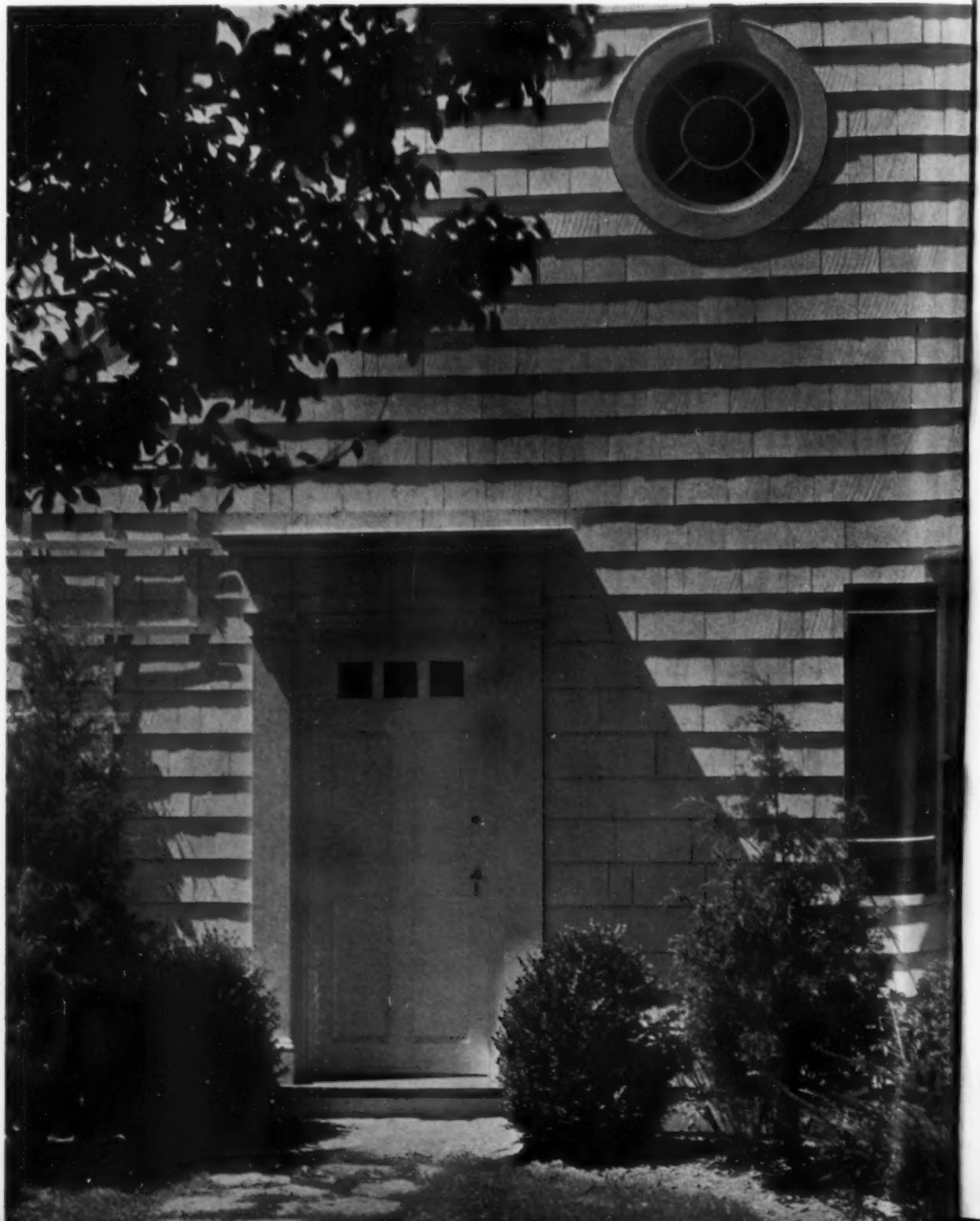




THE ORIGINAL: AN OLD RED BARN, TOO TALL AND SOMEWHAT OUT OF REPAIR, WITH TWO DOORS ON THE WRONG SIDE.

DETAIL OF  
ENTRANCE AND  
EXIT DOORWAY

*Van Ande*





*Van Ande*

THE CHANGES: ROOF LOWERED. THREE DOORS PUT IN OPPOSITE SIDE. WING UTILIZED AS POTTING SHED FOR GREENHOUSE. SIDES RESHINGLED, PAINTED ALL WHITE.

# GARAGE ON ESTATE OF WALTER S. BREWSTER GREENFIELD HILL, FAIRFIELD, CONNECTICUT

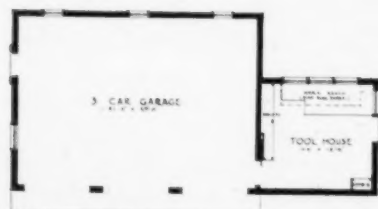
CAMERON CLARK, ARCHITECT

AGNES SELKIRK CLARK, LANDSCAPE ARCHITECT

BEFORE



AFTER



*Van Ande*





*Photographs by Paul J. Weber*

## RESTORING COLONIAL HOUSES

STRICKLAND AND  
STRICKLAND,  
ARCHITECTS

FROM the restoration of parts of the three earliest streets of historical Plymouth, Massachusetts, came the thought that the entire old section of this New England town might be restored. As the old buildings forming these early rambling streets were quite picturesque, and with the added charm of the Town Brook at the foot of the hill, parallel with Summer Street, the neighborhood offered possibilities of becoming a splendid place for those in search of an economical place in which to live.

The Market Street section, between Leyden, the first street, and Summer, the third street, is a shopping district. The groups of houses at that corner have been restored with this in mind. A brick building, built probably in 1825, constituting "The Book Shop," and in which the young couple who operate the shop live upstairs, No. 5 Summer Street, is called "Plymouth House," and contains a glass shop, weaving and antiques. Also tucked away in what is called "Faunce Court" is the "Boat Shop," devoted to prints of the sea, ship models, and other marine objects.

During the restoration and rehabilitation of the seventeenth and eighteenth century houses on Summer Street, we have been astonished at the excellent condition in which we found most of the old framework. The old oak frames are as hard as iron. Decay has occurred for the most part about the sill, where dampness has crept in; most of the roofs are framed with purlins and





ABOVE:

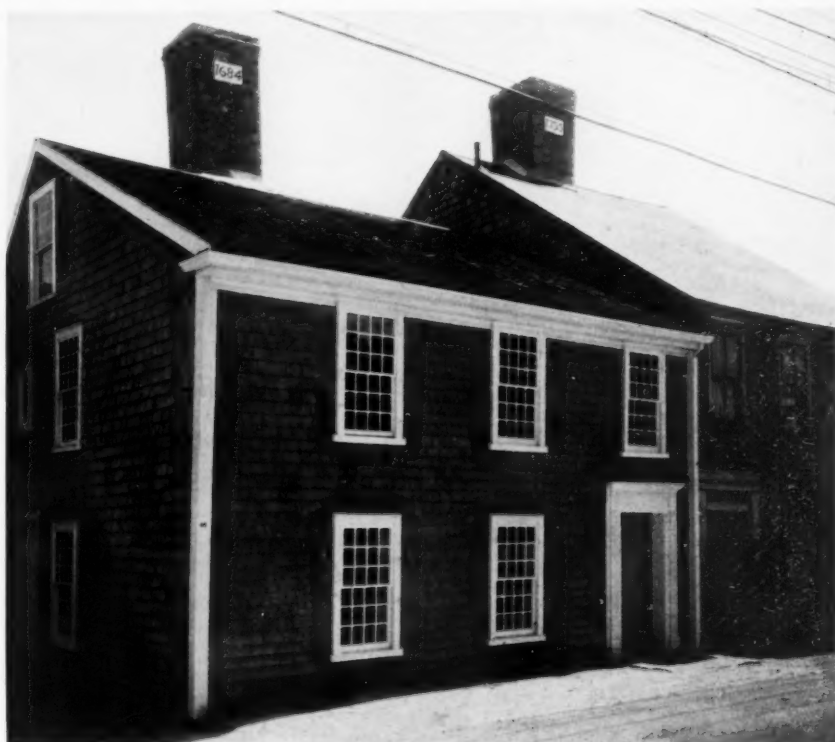
FAUNCE COURT IN PLYMOUTH, MASSACHUSETTS. THE BRICK BUILDING AT RIGHT WAS BUILT IN 1830, AND RESTORED AS A BOOKSHOP BY STRICKLAND & STRICKLAND, ARCHITECTS. AT THE LEFT IS PLYMOUTH HOUSE WITH SMALL APARTMENTS ON SECOND FLOOR AND ANTIQUES AND HANDICRAFTS ON FIRST FLOOR; BUILT AROUND 1685.

OPPOSITE PAGE:

CORNER OF SUMMER STREET, LOOKING UP SPRING LANE, PLYMOUTH, MASSACHUSETTS. HOUSE AT RIGHT WAS BUILT BY GEORGE BONUM IN 1679.

BELOW:

THE MILLER'S HOUSE ON SUMMER STREET, BUILT IN 1684 AND RESTORED FOR A. RODMAN HUSSEY, JR., BY STRICKLAND AND STRICKLAND, ARCHITECTS.



boarded in with wide, rough-sawn pine boards, running vertically to catch any moisture which might creep through the shingles. The framing in an old house, however, is one of the first things to be investigated. This is not always easy, as most beams and corner posts have been cased in.

It should be understood that we are writing about restoration from the more practical point of view. We assume that for the most part the renovizing is to be done with the intent of restoring the old houses as nearly as possible to their original details of sash, doors and hardware on the inside, and window frames, cornice and doorways on the exterior. But at the same time, due consideration shall be given in the plan to modern conveniences—new plumbing, electric wiring and perhaps heating.

The most complicated part of the work is the plumbing and heating. Much unsightliness can be prevented by bunching the pipes so that the carpenter can case them in as corner posts and not mar the general appearance of antiquity.

The client should be persuaded to have as many floor and base plugs and as few wall brackets as possible. Most early houses have scant 3-inch partitions which are not over-hospitable to B.X. cables. Such an arrangement also eliminates too many switch boxes, which are always hard to manage.

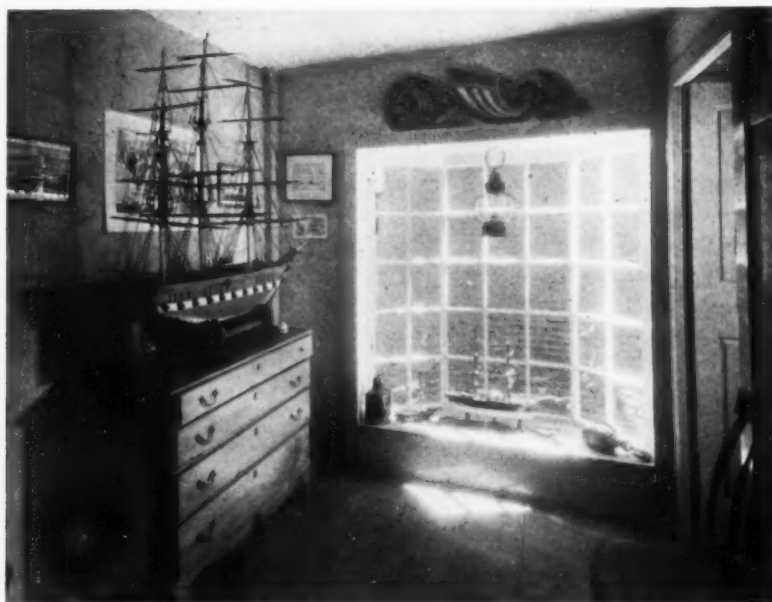
In measuring for new sash, each individual window should be checked and noted on the plan. Often they are of such varying sizes that a specially dimensioned drawing is necessary for the mill.

A small section of flooring in each room should be taken up to make sure that the earliest widest boards are restored.

The following figures are the minimum required to renovate a six-room house similar to those at Plymouth,



CELLAR KITCHEN IN PLYMOUTH HOUSE, 5 SUMMER STREET. BUILT IN 1685 AND RESTORED BY STRICKLAND AND STRICKLAND, ARCHITECTS.



THE BOAT SHOP IN PLYMOUTH HOUSE. STRICKLAND AND STRICKLAND, ARCHITECTS.

Massachusetts. These figures include some, not all, new sash; patching of the roof only, not new roofing; one old mantelpiece; a few old doors with old latches and hinges:

Carpentry, materials, etc.	\$500
Masonry	75
Plumbing	300
Heating	375
Electric wiring	50
Electric fixtures	35
Painting	225
Wallpapers	30
Window shades	25
	<hr/>
	\$1,615

Before this work was started there was a poor, unsteady income, and sales seemed out of the question owing to the fact that people had come to look with disfavor upon the property. Getting rid of the old tenants, followed by cleaning up; patching, tearing down old dilapidated fences and erecting new ones of fitting design and character—all this, with painting, and planting the open areas, changed completely the entire area and brought many applications for the reconditioned buildings. These properties, reconditioned, can be purchased for much less than it would cost to build them new. The mortgages for the most part were from \$2,500 to \$3,500, and with restoration costs of from \$1,500 to \$3,000 in some cases, a property can be acquired for from \$4,000 to \$6,500.

# LIGHTING THE CLASSROOM

## MORE EFFECTIVELY WITH LESS ILLUMINATION

By **HENRY L. LOGAN**

ENGINEERING CONSULTANT

Four outlets, if planned for the working area rather than the entire classroom, can deliver as much light on the desks as the standard six-outlet layout based on the room dimensions and distributing unused light to the traffic areas. The saving in both initial and operating costs may make possible remodeling that would otherwise be too costly.

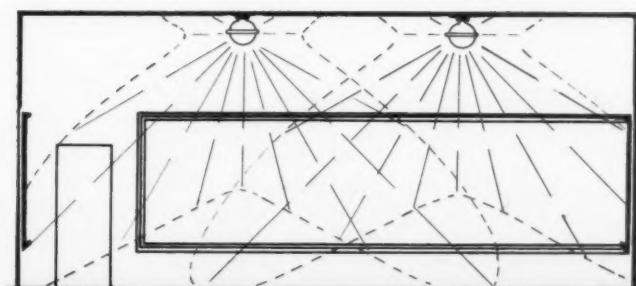
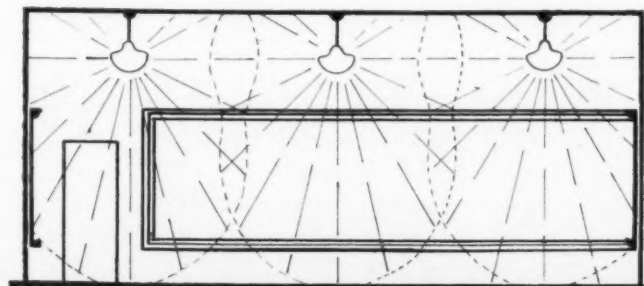
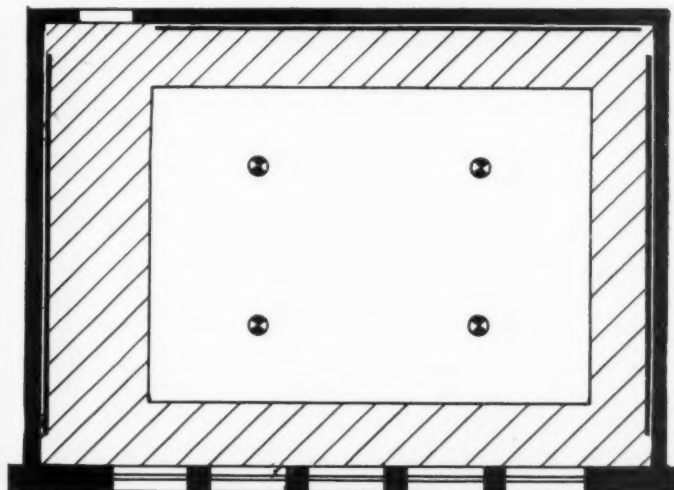
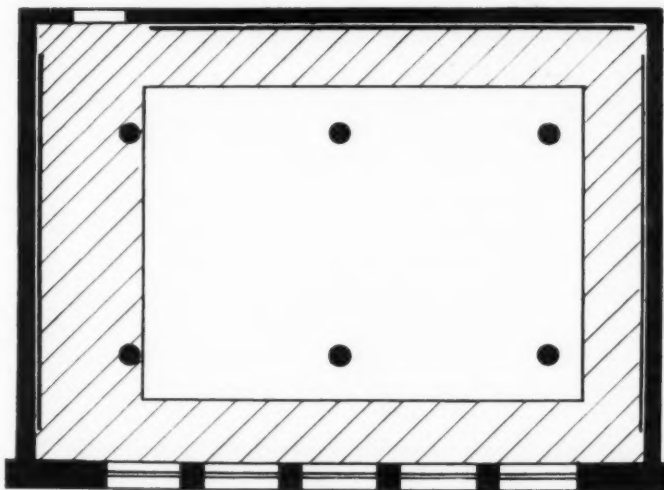
The standard classroom is 30 feet long and 22 feet wide. Its area is 660 square feet. Six lighting units equally spaced provide 110 square feet of floor per lighting unit or 1.8 watts per square foot, using 200-watt lamps per outlet. However, classrooms normally have an aisle at least 3 feet wide around three sides of the room, and a space across the front of the room 7 feet deep occupied only by the teacher's desk. Thus, the working area is only 49 per cent of the total room area.

It is not scientific or economical to light the floor area devoted only to traffic as brightly as the working area. If four units are quartered on the working area it is found that each covers 88 square feet, or 22 square feet *less* than when six units are used on the standard spacing, and that the wattage per square foot of working area is *increased* from 1.8 to 2.3, despite the reduction of units from six to four, and without increasing the size of the lamp.

There may be an offset to these figures in the additional

light returned to the working plane from the surroundings if six units are used, but blackboards, wardrobes and glass areas occupy most of the four walls, reducing the light salvage to a negligible point and leaving only the ceiling, to favor the six-outlet system slightly. The two front units, however, are the chief source of glare and eye discomfort to the pupils as they are in the field of vision all the time; the four-outlet system eliminates this disadvantage.

A further refinement of the four-outlet system is to install light-control units having an "extensive distribution at the ceiling, with no drop, thus keeping them as much as possible out of the field of view and increasing the spread to include the blackboards a little more liberally. Contrary to general opinion very little light is required to make blackboards easily readable if an efficient direction of light is chosen, as the most favorable conditions for vision exist—the maximum contrast of white on black. This placing of the four units causes the light to strike the blackboards at an inclination more nearly normal to the surface, and therefore more effectively reflected from the chalk than is the case with light from the units of the six-outlet system that are closer to the boards and strike at more glancing and less effective angles.

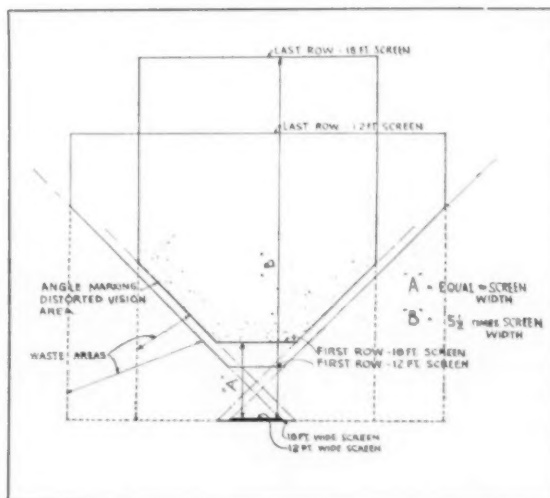


# THE SMALL MOTION PICTURE THEATRE

By BEN SCHLANGER, Architect

1. CONSTRUCTION HAS BEEN RESTRICTED DURING PAST FOUR YEARS.
2. GENERAL OBSOLESCENCE IS APPARENT.
3. NEIGHBORHOOD POPULATIONS HAVE SHIFTED.
4. A GREATER NUMBER OF SMALL THEATERS WITHIN WALKING DISTANCE OF HOMES ARE MORE DESIRABLE THAN A FEW LARGE THEATERS IN CENTRAL LOCATIONS.
5. MANY THEATERS WERE ERECTED BEFORE SOUND AND OTHER TECHNICAL ADVANCEMENTS WERE MADE.
6. SMALL THEATERS OFFER INTIMATE SURROUNDINGS FOR MORE EFFECTIVE SCREEN PRESENTATION.
7. FIRE-RETARDING OR SEMI-FIREPROOF CONSTRUCTION IS ACCEPTABLE BECAUSE PANIC HAZARD IS MINIMIZED IN SMALL CAPACITY AUDITORIUMS. MOST BUILDING CODES RECOGNIZE THIS BY COMPARATIVELY LENIENT REGULATIONS FOR THE SMALL THEATER.
8. SIMPLE STRUCTURAL FRAMING IS REQUIRED.
9. SIMPLE INTERIOR TREATMENT IS EFFECTIVE IN SMALLER AUDITORIUMS, SO THAT COSTLY DECORATION AND ORNAMENTATION CAN BE ELIMINATED.
10. EACH SEAT LOCATION HAS GREATER ACCESSIBILITY.
11. FULL COMFORTABLE VISION OF SCREEN IS MORE EASILY OBTAINED.
12. MORE FAVORABLE ACOUSTICAL SHAPE AND SIZE IS PROVIDED.
13. MINIMUM PROJECTION AND VIEWING ANGLES MINIMIZE DISTORTION OF SCREEN IMAGES.
14. INITIAL INVESTMENT IS MINIMUM.
15. EXPENDITURES FOR ADVERTISING, HOUSE STAFF AND OTHER OVERHEAD ARE LESS.
16. VARIOUS TYPES OF EXISTING STRUCTURES CAN BE ALTERED FOR THEATER USE.
17. POSSIBILITY OF THE EXHIBITOR FINANCING AND CONTROLLING SMALL THEATER CONSTRUCTION IS PREFERABLE TO SPECULATIVE BUILDING WHICH USUALLY RESULTS IN TECHNICALLY INEFFICIENT STRUCTURES.
18. AN INCREASED NUMBER OF FILM PRODUCTS OF HIGH QUALITY ARE AVAILABLE FOR REVIVAL SHOWINGS IN SMALL THEATERS.
19. NEED FOR COSTLY STAGE STRUCTURE AND STAGE TRAPPINGS IS ELIMINATED IN SMALL THEATERS.
20. COSTLY AIR CONDITIONING SYSTEMS ARE UNNECESSARY; INSTEAD, MODIFIED AND LESS EXPENSIVE AIR CONDITIONING CAN BE ATTAINED BY PROPER VENTILATION COMBINED WITH PARTIAL COOLING AND DEHUMIDIFICATION.

20 REASONS INDICATE A NEED FOR, AND DESIRABILITY OF, NEW AND SMALLER MOVIE THEATERS



## SEATING CAPACITY

A minimum seating capacity naturally allows a structure of minimum size, thereby reducing cost, but the small theater does not always have the lowest cost per seat. The lowest cost per seat is more easily obtainable in a large unit than in a small unit. But it must be remembered that initial low cost per seat is a foolish objective if the income per seat becomes less than the income of a seat with a higher initial cost. Since the per-seat income is greatly reduced when a theater has more seats than necessary it is important to arrive at the absolute minimum seating capacity which will insure a sufficient economic return.

Exactly how small a motion picture theater can be and still be an income-producing unit is determined by a number of factors, some of which are (1) *population to be drawn from*, (2) *transient or residential location*, (3) *competition offered by other houses*, (4) *number of program changes per week*, (5) *local building ordinances*, and (6) *admission prices*.

The expected patronage consists of those persons who are within fairly short walking distance in towns and cities, and the shortest riding distance in rural locations. In a big city it would be those persons who could be attracted to a theater located on a popular street as transient patronage.

A residential territory lacking a motion picture theater and having a population of approximately as little as from 4,000 to 6,000 could utilize a 600-seat unit. This population may produce about 450 patrons at one time as an average. But 600 seats would be necessary to take care of peak good days and week-end business.

A greater population within a limited territory, such as may occur in large multiple-dwelling neighborhoods, does not necessarily justify the erection of an increased capacity unit. Such a neighborhood could more readily do more business totally in two small



## SIZE OF STRUCTURE

units than in one large unit. The greater choice in program for the patron permits this, thus encouraging more habitual patronage on the whole.

Theaters with a capacity of from 200 to 500 seats are feasible under two different conditions—the first for rural districts of population below 4,000, and the second for transient locations in big cities. In the case of the transient unit 300 seats have the efficiency of twice as many and even more, because of the repeated use of each seat during the day's business.

These small units can be erected very economically, especially in small towns where luxurious materials and superfluous eye-catching architecture can be dispensed with. This should be true for city locations as well.

The second consideration affecting the cost of the motion picture theater is the size or the total number of cubic feet of structure. Besides the seating capacity are such factors as the proper seating arrangement, the proper size of the motion picture screen, lounge and toilet facilities, circulation spaces in lobby, foyers, standee area, aisles, and so on. To these items there can be, and usually is, given an enormous amount of cubic feet. Correct minimum sizes for these portions will control the initial construction cost without sacrificing the effectiveness of the whole.

The size of the screen and the size and shape of the auditorium seating space are interdependent. For each seating capacity problem there is a seating plan which will require a minimum of square-foot area. This at the same time will have a maximum of floor area affording an undistorted view of a screen. The screen size will accommodate rear as well as front row seats. Some of the factors which will control the size of the structure are:

1. *Distance from screen to first row:* A minimum distance equalling at least the width of the screen.
2. *Distance from last row to screen:* A maximum distance equaling no more than  $5\frac{1}{2}$  times the width of the screen.
3. *Circulating aisles arrangement:* A minimum number of aisles across the width of the auditorium.
4. *Side seat distortion.*
5. *Size of screen.*

In the accompanying illustration is shown diagrammatically the effect that the width of the screen may have on the seating plan arrangement. Two screen widths are shown—one 12 feet wide, the other 18 feet wide. A seating capacity of approximately 600 is the basis of the study.

In each case the last and first rows are located as governed by the screen width. Note that the shape of the seating plan necessary for the 12-foot screen utilizes a rectangle greater in area than necessary for an 18-foot screen. Note also that the 18-foot screen in this diagram has much less of the extreme size seats. The smaller screen to use the narrower deep-shape plan with the wider screen. The deep shape is commonly used, but with too small a screen to permit comfortable vision from the last rows.

The aisle arrangement of the narrower plan, which would have a bank of seven seats against each side wall, two aisles and a center bank of 14 seats, is a most efficient space-saver. Adding more seats to the width would force the use of two additional wall aisles, because most building codes do not permit more than seven seats in a bank with access to one aisle only.

Much space can also be saved in the planning of the smaller cinema if minimum area is given to lobbies, foyers, promenades, standee space, and the like. The distance between the first set of entrance storm doors and the next set of doors need never exceed much over 10 feet. The standee space behind the last row of seats, usually made more than 10 feet deep, can be reduced to 5 or 6 feet.

It is better to provide a lounge room for patrons who must wait for a seat. Space for this lounge room could be found by eliminating separate men's and women's lounges adjoining the respective toilet rooms, and instead of having two lounges, arranging for one common lounge placed near the auditorium seating. Only a very small anteroom, approximately 5 by 8 feet, is necessary in front of each toilet room.

The total height of the auditorium should be no higher than 2 feet above the top of the screen. Any additional height only serves to increase cost without giving any worthwhile advantage. Given the approximate simple architectural form and lines, low ceiling heights can be treated successfully.

THE WEATHER OBSERVATION  
TOWER IN NEW YORK CITY

*Ewing Galloway*



THE ARCHITECTURAL RECORD, JUNE 1934

**TECHNICAL NEWS**  
AND  
**RESEARCH**

BY

REALTO E. CHERNE  
CHESTER L. NELSON

**AIR CONDITIONING**

# PRELIMINARY PLANNING

## FOR AIR CONDITIONING

### IN THE DESIGN OF MODERN BUILDINGS

**Realto E. Cherne**

**Chester L. Nelson**

When the architect or engineer comes to the problem of installing an air conditioning system in a building, a number of questions must be answered before plans can be drawn. Since these questions are similar for all types of buildings, a brief explanation of some fundamentals of air conditioning that must be considered for the general design problem is necessary. This article, therefore, differs from the usual discussion of individual air conditioning installations in which difficult designs were encountered because of architectural peculiarities; instead, it covers the more general problem of designing or renovating a building with proper initial consideration of the air conditioning problem.

All architects and engineers are more or less familiar with the requirements of ordinary ventilation, direct radiation, sprinkler systems, plumbing systems, and other mechanical features. The required floor area, riser space, equipment space and approximate costs of installation and operation may be quickly approximated for use in a preliminary study of a building. Many designers have asked if a similar array of constants can be set up in order to include scientific air conditioning in the preliminary study rather than delay until after the fundamentals have been determined—thereby causing a greatly increased cost of both equipment and building. The owner objects to a new building designed with-



out complete modern mechanical equipment; the architect objects to adding something that is not completely within his practice; and the air conditioning engineer dislikes having to overcome needless and very often costly design problems which are almost certain to appear when proper initial consideration has not been made. Generally considered, the present procedure is quite unsatisfactory to every one interested in modern building construction. Nevertheless, as the following discussion will point out, the air conditioning engineer is reluctant to broadcast unit figures when he does not use them himself; in other words, every job is "tailor-made."

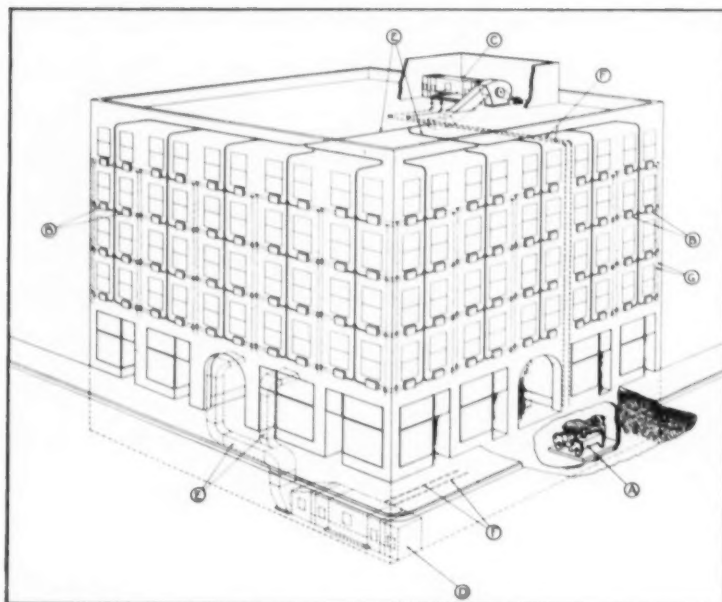
It is a comparatively simple matter for one familiar with the science of air conditioning to design and approximate the cost of an installation after preliminary building plans have been made. In many cases, however, the prospective owners and designers of new structures must make a complete study of the unit as a whole before even preliminary drawings are made. Too much emphasis cannot be placed on the possibility of erroneous application of constants and unit figures for the reason that air conditioning capacities cannot be determined by air-change values as ordinary ventilation calculations commonly are made. The following discussion of fundamentals presents the general problems encountered in air conditioning work which have direct bearing on preliminary plans.

#### **SOURCES OF HEAT:**

It is generally understood that different concentrations of occupants and illumination, together with variable outside weather conditions, affect considerably the load placed on an air conditioning apparatus. For this reason, it is well to discuss briefly the various factors upon which capacities and loads are dependent. This discussion will be limited to air conditioning for comfort since the inclusion of data on industrial air conditioning would necessarily be of a more technical nature.

(1) The first factor to be considered is the variation of outside weather conditions and the amount of outside exposure in relation to the total cubical contents of the building. Further, in the northern hemisphere the south, east and west sections are affected to a greater extent than the north exposure by heat from sunlight. The top floor or spaces immediately beneath the roofs or offsets require special consideration because of the roof load which is usually high owing to poor heat insulating qualities of the roof construction.

(2) This leads to a second variable involved in load calculations—building construction. It is evident that better heat insulating qualities of walls, partitions, floors and roofs will make possible smaller apparatus and lower operating costs. Recent studies have indicated, on specific installations, that it is more economical to insulate the roof properly



Schill Studio

A DIAGRAM SHOWING HOW AIR CONDITIONING MAY BE APPLIED TO A MULTI-STORIED OFFICE BUILDING. THE STORES ON THE FIRST FLOOR LEVEL ARE HANDLED BY A SEPARATE SYSTEM. AS INDICATED, THE REFRIGERATED WATER IS PUMPED FROM THE REFRIGERATION MACHINE IN THE BASEMENT TO THE TWO DEHUMIDIFYING UNITS. THE ONE LOCATED ON THE ROOF SUPPLIES CONDITIONED AIR TO THE DISTRIBUTING SYSTEM LEADING TO THE WINDOW BOX UNITS. THE APPARATUS LOCATED IN THE BASEMENT SUPPLIES CONDITIONED AIR TO THE VARIOUS STORES. THE LETTERS SHOWN IN THE SKETCH INDICATE THE FOLLOWING:

than to install and operate equipment of sufficient capacity to provide for the increased load involved where ordinary construction is maintained.

(3) The removal of heat and moisture from occupants is a greater portion of the total load than most individuals realize. Heavy concentrations of people very often require special study. The activity of the population greatly affects the total amount of heat dissipated. Sensible and latent heat\* must be separated in the calculations, because the method of providing for the removal of each is different. In general, the sensible heat affects the amount of conditioned air, while the latent heat directly affects the refrigeration load.

(4) Heat given off by lights has a direct bearing on, and often is a major portion of, the total air conditioning load. Modern methods of illumination with increased application of indirect lighting and a consequent increase in wattage per unit of floor area will add still greater weight to this factor in the future. The use of independent ventilation units, to remove the major portion of the heat from the light coves, will prove economical.

(5) Another important variable involved in load calculations is the item of air infiltration or leakage. This factor requires special consideration in tall buildings due to pressure conditions and stack effect of vertical risers, stair ways and elevator shafts. The possibility of large heat losses or gains due to leaky sashes has indicated the advisability of double windows or double glazing in some cases.

After a proper analysis has been made of the conditions to be maintained and the heat loads encountered, the next step is to determine the most applicable

\*The total heat given off by people is composed of the sensible heat, or heat due to the temperature as indicated by the thermometer, and the latent heat, or heat of vaporization of the moisture or perspiration. Thus, at 80 degrees dry bulb and 50% relative humidity, the total heat given off by an average man at rest is 400 B.t.u. per hour, of which 55% is sensible and the remainder latent.

## ZONING:

- A. REFRIGERATION EQUIPMENT.
- B. WINDOW BOX UNITS.
- C. AIR CONDITIONING APPARATUS FOR OFFICES ON UPPER FLOORS.
- D. AIR CONDITIONING APPARATUS FOR STORES.
- E. AIR DUCTS.
- F. REFRIGERATED WATER PIPING.
- G. STEAM AND RETURN PIPING.

## LOCATION OF EQUIPMENT:

## SOUND:

type of system. When dealing with air conditioning systems for large buildings, it is generally considered best practice to divide the complete job into a number of suitably sized units. In some cases a unit per floor or group of floors may accomplish the work satisfactorily, whereas in others it may be necessary to have separate units for each of the quadrant exposures of the building. Where the floor area is large in relation to the outside wall exposure, it is evident that provision must be made for the variable load to which the outer bay is subjected. The heat loads on inside rooms or bays are apt to be less variable since the fluctuations of the outside weather conditions are not a direct factor in load. Such a condition often results in a natural zoning or segregation of rooms having similar exposures and internal heat loads.

One of the first questions to be settled in any air conditioning design is the location of dehumidifying and refrigeration equipment. In general, it is best to place all the dehumidifiers, commonly called air washers, on the same level, preferably on one of the upper floors where clean outdoor air is readily available, so as to allow a closed circuit for the cold water system. The cold water pumps then need only work against friction head since the vertical or static head is balanced in the supply and return lines. The refrigeration equipment is usually located in the basement along with boilers, fire pumps, and the like. In the case of a system designed with all the dehumidifiers on one level it is generally necessary to have booster fans located on the various floors to provide for local control and also to insure proper distribution of supply air.

The problem of sound insulation and isolation in connection with air conditioning work is increasing in importance. With the advent of sound studios and "talkies" it became necessary for the engineer to develop methods of preventing transmission of noise through ventilating ducts. Gradually some of this information has been applied to other types of work. The cost of sound control is a direct function of the "quietness" desired, and for this reason certain sound levels have been recommended to assist in attaining the proper economic balance for various applications; for example:

Residences	10 db*
Sound Stages	5 db
Hotel Sleeping Rooms	10 db
Broadcasting Studios	8 to 12 db
Private Offices (extra quiet)	10 db
(ordinary)	15 db
Theaters	12 to 18 db
General Offices (small)	25 db
(large)	30 db

*\*db is the abbreviation for decibel which is a commonly used unit for the intensity of noise or sound. Technically, the decibel is a logarithmic ratio of the energy of a sound to the energy of a sound just barely audible.*

Acoustical problems encountered in air conditioning work, as outlined by V. O. Knudson in the October 1931 issue of HEATING, PIPING AND AIR CONDITIONING, are in part as follows:

1. "The selection of equipment which operates without generating excessive noises.
2. The location and insulation of the equipment room so that no direct noises are transmitted through its walls and ceilings into adjacent rooms.
3. The mounting of the equipment on flexible supports which have been designed (based upon calculations, not guessed) to provide sufficient insulation to prevent solid-borne vibrations from disturbing any part of the building.
4. The design of suitable filters for the ducts to prevent sound transmission from the equipment room to audience or work rooms, or from room to room.
5. All of these problems can be solved quantitatively in advance of installing the equipment, so that the control of sound in the air conditioning of buildings can be removed from the realm of guesswork and empiricism, and placed upon an unfailing and rigorous engineering basis."

Recent research has been directed toward determining the effect of noise on health and efficiency. The fact that efficiency falls off when a person works in a high noise level has been established and is generally known. An air conditioning system allows the windows to be closed during all seasons of the year, and thus most of the extraneous or street noises are eliminated.

Among points to consider in determining the method of distributing conditioned air in buildings are such items as ceiling heights, locations of partitions and construction of ceiling (that is, beamed or hung).

Up to this time, the major portion of building air conditioning has been accomplished by means of grille outlets located in permanent corridor walls. Recently, however, the trend has been toward low-pressure nozzles placed under the windows or in permanent corridor partitions. The former, a window box unit, is designed for cooling and dehumidifying in summer and heating and humidifying in winter; such an installation will dispense with supplementary direct radiation under windows since a heating coil is an integral part of each unit. The latter, a wall unit, may be used to advantage when a central corridor is available for the distributing ducts. However, direct radiation, or other means of providing for heat losses, must be used in conjunction with the system. In general, it should be remembered that space must be allotted on the plans for a complete system of supply and return air ducts leading from the equipment

#### AIR DISTRIBUTION:



or fan room to the various conditioned areas. Whether a particular installation should be designed for use of side wall outlets, window box units, or overhead pan distribution should be determined by a competent air conditioning engineer. He must analyze the load conditions, room usage, available equipment space, operating costs, and the possibility of obtaining suitable automatic control of the system. This latter item is generally overlooked despite its importance. An air conditioning system loses its effectiveness if it is designed in such a manner as to preclude the use of automatic controls for temperature and/or humidity.

**COOLING  
TOWERS—  
CONDENSER  
WATER:**

A problem of major importance which often does not receive proper consideration, both in building construction and in the operation of an air conditioning system, is that of providing water for condensing purposes. Where the refrigeration load is large, it may be impossible to obtain sufficient water from city mains, wells, rivers or lakes to operate the condensers. This makes advisable the installation of a cooling tower or spray pond on top of the building. In order to do this, however, the steel work must be designed for the additional load. Architectural design of modern buildings seldom provides suitable roof area for cooling towers or spray ponds, and to overcome this difficulty it may be necessary to provide space for a forced draft cooling tower which is essentially nothing more than an air washer and fan assembly.

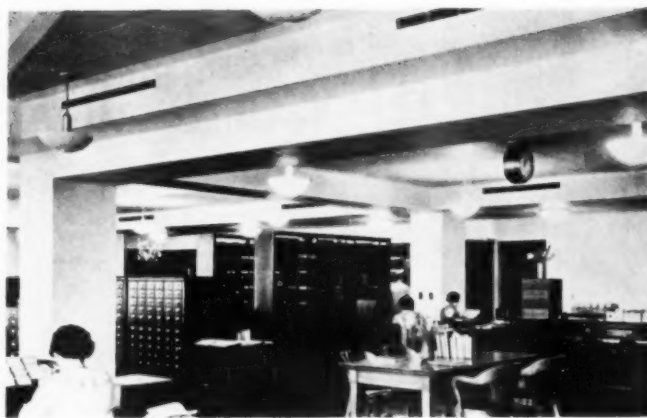
It should be borne in mind that although sufficient condensing water is available at present the supply may be restricted at some future date. For this reason, on some recent installations, provision has been made for the future addition of a cooling tower although city water at the present rate is more economical than owning and operating such a tower.

**AIR  
CONDITIONING  
EQUIPMENT:**

A complete air conditioning system consists essentially of the following equipment:

1. Refrigeration equipment.
2. Washers, fans, heaters, filters, motors.
3. Duct work.
4. Automatic controls.
5. Water piping and pumps.
6. Insulation and isolation.

These divisions in equipment are listed to show the number of items which enter into the cost and space taken by an installation. It is apparent that any duplication of motors, pumps, and so on, for emergency or auxiliary use will forestall the use of a unit price based on a standard installation. Specifications calling for copper dehumidifiers, copper dampers, brass pipe or other special



construction or controls will also tend to make unit costs and factors unreliable. From actual costs of air conditioning installations in large buildings (excluding theaters and auditoriums) in various localities, it has been found that present initial costs may vary from 75c to \$2.50 per square foot of usable floor area. For small buildings the cost is somewhat higher. On a cubical content basis, it may be said that the cost will run from 7c to about 25c per cubic foot depending on the variables discussed above.

In recent years industry has gradually adopted the idea of analyzing equipment installations on the basis of balancing the cost of operating against the first cost of equipment, and has begun to consider this relation essential in the initial determination of new building features. Naturally this trend has entered the field of air conditioning with the result that such analysis is being made in the design of all current projects.

Such a method of balancing consists of striking an economical relationship between size of equipment and the first cost. The first cost of installation is quite often a poor index of the total cost of owning and operating an air conditioning system and this should not be the sole deciding factor for the purchaser. For example, an installation may be of sufficient capacity to maintain the desired conditions and yet be of such design and size as to entail excessive cost of operation. The equipment may be taking insufficient outside air to provide for intermediate seasons\* when neither refrigeration or steam should be used. In such instances it is necessary to run the refrigeration equipment more hours each day and many more days each season than for a well-designed system capable of circulating sufficient outside air. The additional cost of operating the refrigeration machines and cold water pump would readily pay for the small increase in air capacity required of the dehumidifier.

To determine the operating costs of an air conditioning system it is necessary to consider an array of variables so complex in nature that all calculations must be considered as approximations only. Due to these many variables it

#### OPERATING COSTS:

*\*Intermediate seasons may be taken to apply to late summer and early fall, as well as late spring.*

LEFT: APPLICATION OF HIGH-PRESSURE WALL TYPE OUTLET FOR EFFECTIVE DISTRIBUTION OF CONDITIONED AIR.

RIGHT: AN OFFICE AIR CONDITIONING APPLICATION WHERE THE AIR DUCTS ARE FURRED IN AS BEAMS, AND LOW-PRESSURE SLOTTED OUTLETS ARE USED FOR DISTRIBUTING THE AIR.

#### OPERATING COSTS IN DETAIL

is impossible to obtain a purely mathematical solution.

It is necessary to make certain basic assumptions or approximations regarding the weather and operating efficiencies. In this connection it should be noted that a good operator will save money and a poor one may waste much more than the difference in salary required to acquire a good man. Inefficient results may often be traced back to the fact that the man in charge does not fully understand the principles involved.

Obviously, the only accurate method of determining the operation cost of a system is by the use of meters and methodical records. When an attempt is made before installation to predict the yearly cost of owning and operating equipment, however, a thorough knowledge of the machines and an understanding of fundamental principles is essential. The complexity of the problem is increased still further by fluctuating outside weather conditions which vary from hour to hour and day to day; this condition precludes the use of temperature averages and makes a detailed study necessary.

A detailed approach to the problem is presented:

#### A. Fixed charges (commonly known as capital charges).

(1) *Depreciation charges* involve determination of the total first cost of the equipment, which includes not only the air conditioning contract price but also a reasonable addition for all supplementary work necessary for the completion of the installation. The total first cost of the installation should be distributed over a period of years consistent with the nature of the installation and stability of real estate values. For well-designed air conditioning equipment it is possible to use the same rate of obsolescence as used for the building.

(2) *Interest loss* is generally figured at a reasonable rate (say 4-6 per cent ) on the average amortized value of the apparatus.

(3) *Taxes* are difficult to figure accurately since the assessment valuations do not always coincide with the theoretical value of the property. This item naturally varies with locality.

(4) *Rental value* of the floor space which is occupied by apparatus must be considered in the complete analysis.

(5) *Insurance* on the property should be figured at appropriate rates.

#### B. Service charges.

(1) *Salary of operator* or operators should be based on the amount of time required and the relative value of that time. Normally, when a licensed refrigeration engineer is required, the responsibility of the entire operation is entrusted to his charge. Quite often, the salary of operators is included in the *capital charges*.

(2) *Maintenance* consists of normal replacements, oiling, greasing, and repletion of refrigerant. Periodical painting of equipment may also be included under this item.

(3) *Make-up water* is the very minor water load which is used by the humidifier or dehumidifier. Under ordinary conditions this consists of evaporation losses and water necessary for cleaning and replacement.

(4) *Steam consumption* is computed after study of the prevailing weather conditions for the particular locality, and after evaluation of the heat gains and losses which may be credited to the particular building. For convenience in computation, the steam load should be divided into three parts:

(a) Steam required to preheat or raise the air from the outside temperature to the apparatus saturation temperature.

(b) Steam required to provide for heat losses through walls, windows and roof.

(c) Steam necessary to reheat the air from the apparatus saturation temperature to the room dry-bulb temperature.

(5) *Condenser water* costs for refrigeration purposes must also be computed. If a cooling tower or spray pond is used, the pumping power cost must be added to the windage and evaporation losses.

(6) *Apparatus power*, exclusive of refrigeration power, is determined by the length of time the related apparatus—pumps, fans, and so on—is in operation. The efficiency of power transmission should not be neglected.

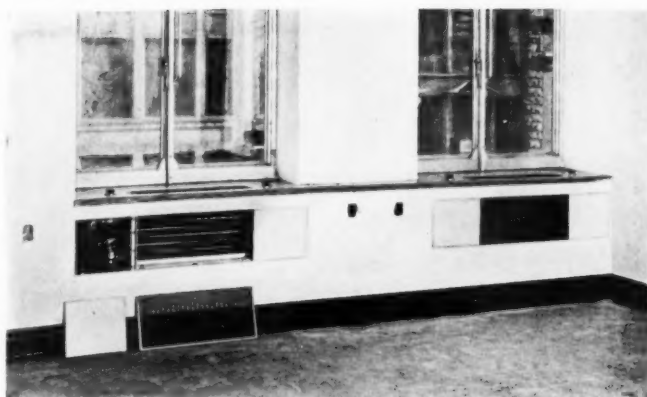
(7) *Refrigeration power* may be computed only after a study of complete weather conditions together with all the variable load factors involved.

From the nature of the variables it may be readily appreciated that total owning and operating costs will vary considerably. Actually these values may range from 15c to 35c per square foot of usable floor area per year in large installations. It should be remembered that these values include all fixed charges and service charges as previously listed. For smaller projects the cost will increase owing to the fact that the ratio of initial cost to conditioned area is greater.

During the last fifteen years there have been many changes in air conditioning equipment. While systems installed that long ago are still producing the proper conditions within the rooms, it does not follow that the same design would be used in a modern installation. Much has been learned about air diffusion, air distribution, mechanical refrigeration, and sound absorption. This knowledge has been incorporated in recently designed systems. Occasionally the ques-

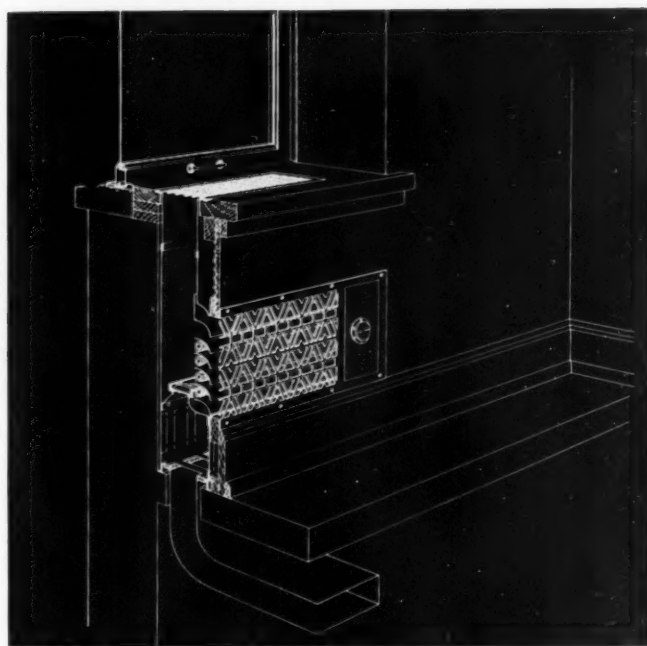
#### CHANGES IN EQUIPMENT





*Paul W. Davis*

THE WINDOW BOX UNIT, AS APPLIED TO OFFICE BUILDING CONDITIONING. THE UNIT AT THE LEFT IN THE PHOTOGRAPH HAS THE OUTER GRILLE REMOVED TO SHOW STEAM CONNECTIONS TO HEATER.



*Schill Studio*

tion is raised whether it is advisable to design a building today with provision for installing air conditioning at some future date, say ten years distant. Since research is constantly bringing out and developing new ideas, it is possible that space provisions made today may become entirely inappropriate in the future. In this event, it would be necessary for the future designer to go back to antiquated equipment or design special equipment to make a system fit the old plans.

Among the more recent developments in effective distribution of conditioned air are the low-pressure nozzles for location under the windows or in permanent corridor partitions. Both these types of distribution have considerable merit over the pan or grille supply systems in office buildings because individual control of each unit is possible without disturbing the balance of the installation. In addition, it is possible to use a higher temperature differential between the air entering the room and the room temperature and in this manner decrease the quantity of air supplied to the units. Thus, in comparison with an old type system, smaller ducts may be used. A higher temperature differential may be used because a primary current of air is introduced in such a manner as to induce a secondary air circulation greater than its own volume. In this way, the actual air diffused in the room may be greater than that in an overhead system even though a much smaller amount is carried through the ducts.

One of the chief problems of a building designer is to maintain as much rentable floor space as possible without sacrifice of efficiency in the mechanical equipment. The window box unit lends itself quite readily to the conservation of floor space and ceiling height because the duct work usually consists of ver-

tical risers furred in the pilasters, with small horizontal ducts leading to the individual units. In some instances it may be advisable to have the vertical risers in the general utility space and then have horizontal ducts in the corridors from which small horizontal leads may be made to the individual units.

In any case, it is desirable to plan the steel framing with provision for simple duct work rather than to determine the steel design first and then be confronted with intricate problems of duct design and resultant higher costs for operation of the system. When the duct and riser requirements are known, it is generally a simple matter to provide proper steel framing. On the other hand, if the steel is designed before thought is given to air conditioning requirements, the result is a much more costly and inefficient installation.

One of the recent developments particularly adapted to individual office installations is the self-contained automatic air conditioning unit. In summer, when used in conjunction with a refrigerating machine, it distributes cool, dehumidified air, while in winter, when connected to the building's regular heating system, it provides evenly warmed humidified air. The cooling and heating coils are built into the cabinet itself, as is the blower for circulating the air. Cooling only, heating only, or both in the proper season may be furnished according to the type of cabinet selected.

The importance of accurate preliminary planning for air conditioning in the design of modern buildings cannot be over-stressed. Such initial consideration is justified by the reduced cost made possible to the owner both in building construction and in equipment, and also because maximum operating efficiency may be made possible through proper design of the equipment installed. The large number of variables encountered and the difficulties met with in air conditioning work tend to place such preliminary study in a highly specialized field. For this reason, the problem cannot be properly solved by the use of constants and unit values in the same manner as problems of ordinary ventilating, direct radiation, sprinkler systems, and the like. The problem is complicated still further by the ever increasing number of new developments being continually brought out by the rapidly expanding science of air conditioning. It is possible, however, for the air conditioning specialist to make a preliminary survey of a project and to formulate the design of equipment which will meet the building requirements set down by the owner; also, it is possible to predict roughly the yearly operating cost of the equipment. It is therefore the function of the air conditioning manufacturer, who must of necessity be a specialist, to cooperate with the owner, architect, and consulting engineer from the start in the preliminary planning of a building.

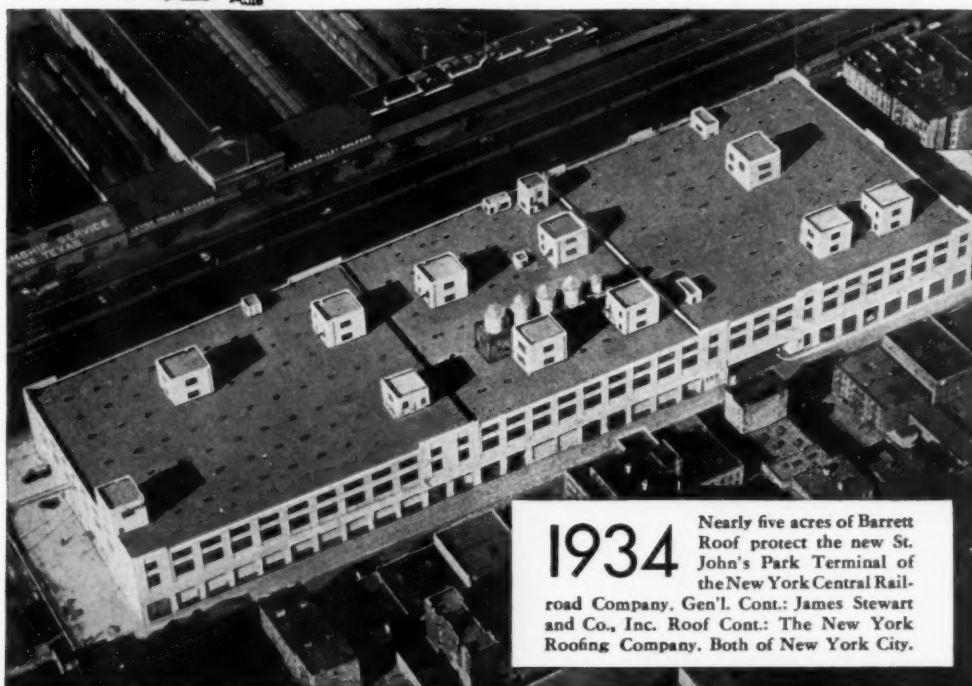
## CONCLUSION

# 1868 to 1934 shows New York Central what to expect of this roof from 1934 to 2000



1868

The 3½ acre Barrett Roof on the old New York Central Warehouse and Freight Depot, New York, erected in 1868, is still in good condition after 66 years of service.



1934

Nearly five acres of Barrett Roof protect the new St. John's Park Terminal of the New York Central Railroad Company. Gen'l. Cont.: James Stewart and Co., Inc. Roof Cont.: The New York Roofing Company. Both of New York City.

Fairchild Aerial Surveys, Inc.

**B**ack in 1868 a Barrett Pitch and Felt Roof was applied to the old New York Central Warehouse and Freight Depot on New York's west side waterfront. For 66 years this roof has given expense-free, trouble-free, fire-safe protection.

Naturally, a similar Barrett Roof was selected for the enormous St. John's Park Terminal which replaces the old structure. The new building, which can house and handle a train of 150 cars, will be New York's largest terminal.

To New York Central "Recover Right with Barrett" represents sound roofing policy.

Give your building the same long-lived Barrett Roof protection. Consult with your local Barrett Approved Roofer, or with us on any roofing or waterproofing problem.

#### THE BARRETT COMPANY

40 Rector Street New York, N. Y.  
2800 So. Sacramento Ave. Chicago, Ill.  
Birmingham, Ala.

In Canada: THE BARRETT COMPANY, Limited  
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**RECOVER RIGHT  
with**

**Barrett  
ROOFS**

*for Eye-Comfort Illumination*



**SPECIFY**

**MAGNALUX LUMINAIRES**

**SELECTED BY NEW YORK'S EYE INSTITUTE**

*Westinghouse Magnalux Luminaires are installed in New York's Eye Institute, where every aid is supplied to conserve sight.*



**T**ODAY'S rapidly growing demand for illumination that lessens eye-fatigue . . . speeds work . . . reduces costly errors, is adequately met by Westinghouse Magnalux Luminaires.

We consider their installation by New York's Eye Institute one of the finest tributes that can be paid a lighting fixture. At the Institute, every aid is made available for sight conservation. Naturally, a thorough investigation was made before Magnalux units were selected.

Efficiency, beauty, and eye-comfort . . . the prime requisites of modern lighting

. . . are combined in the design of the Magnalux. Its hyperbola-shaped basin, made of dense, highly reflective Galax glass, imparts maximum efficiency. A slender stem connecting a small canopy and husk complete the simple lines which enhance its decorative appearance.

Light is delivered over a wide ceiling area, so evenly diffused that office workers are not conscious of its overhead sources.

A representative from our local office will gladly furnish complete information—or, address Westinghouse Electric & Mfg. Co. Room 2-N, East Pittsburgh, Pa.

**W E S T I N G H O U S E**



T 85042



# NATIONAL COPPER-STEEL RUST-RESISTING PIPE

for soil, waste,  
vent lines,  
rain leaders  
and steam  
returns




No matter what type of building, the modern architect and engineer look to the durability of the equipment to hold down maintenance costs. Pipe, especially, plays an important part when not only repairs or replacements, but also possible interruptions to service are considered. This is why NATIONAL Copper-Steel Pipe is being increasingly used for soil, waste, vent lines, rain leaders, and steam returns in the modern industrial building. Those responsible know that copper-steel pipe lasts longer where

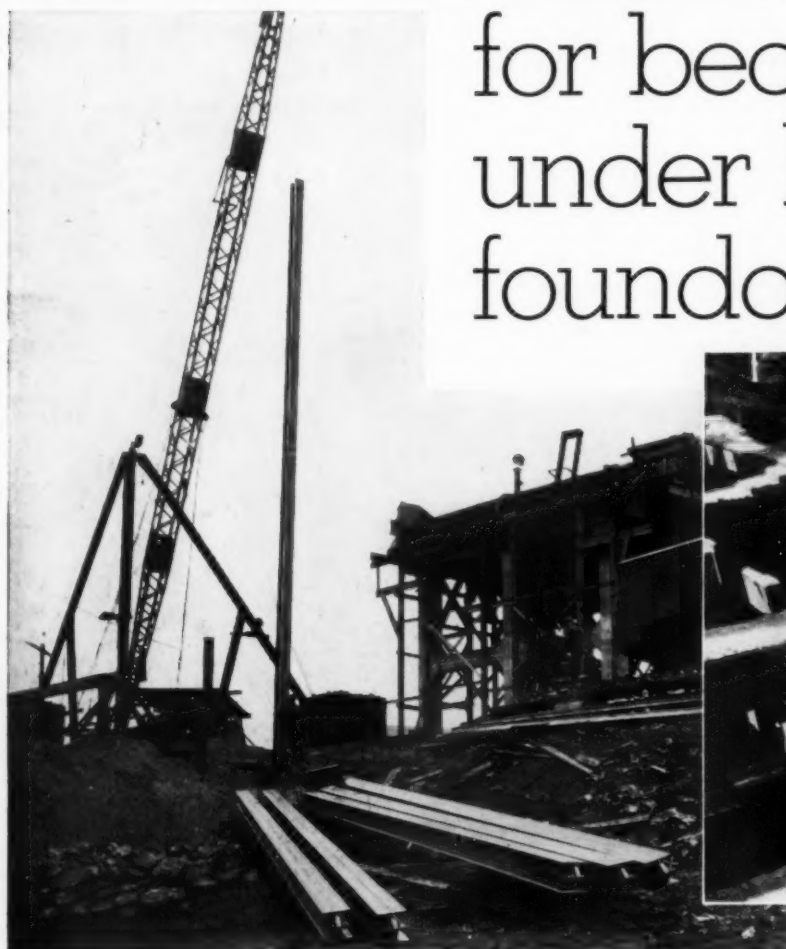
atmospheric corrosion or certain alternate wet and dry conditions prevail. Numerous tests and extensive installations by leading users the country over have again and again confirmed this fact. And remember, you don't have to pay a high premium for copper-steel—just a trifle over regular pipe; yet you are assured of rust resistance not surpassed by any ferrous material within a justifiable price range. Take advantage of this economy and specify NATIONAL—*The Original Copper-Steel Pipe* (Made since 1911).

**LOOK FOR THE GREEN COLOR**—National Copper-Steel Pipe is marked as follows: Black Pipe—Smaller sizes colored green. Larger sizes, two green stripes running lengthwise. Galvanized Pipe—All sizes, two green stripes running lengthwise.

NATIONAL TUBE COMPANY • Pittsburgh, Pa.

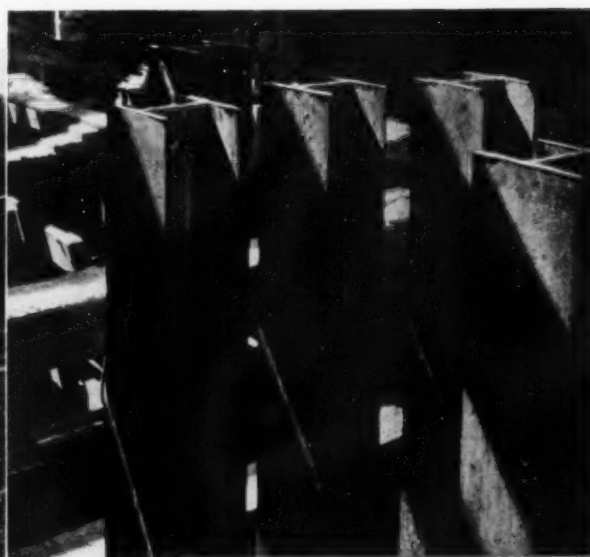
Subsidiary of United  States Steel Corporation

# C B S E C T I O N S



*One of the longer piles on the Kansas River Bridge, ready to be driven. Other shorter piles in the foreground show method of pointing and reinforcing web at lower end. Many of the piles were driven without this reinforcing or pointing and without any difficulties in driving.*

## for bearing piles under bridge foundations



*A typical bell cluster of H-piles [C B Sections]. Driving has been completed. Note condition of tops. Kansas River Bridge built by Kansas State Highway Department. Designing Engineers: Sverdrup & Parcel. Contractors: Kansas City Bridge Company.*

CB SECTIONS have been successfully employed as bearing piles under the foundations of a number of recently constructed bridges. Their use in the Kansas River Bridge at Kansas City, Kansas, illustrates the satisfactory manner in which these structural section H-piles meet certain conditions. 335 piles were used, ranging in length from 37 ft. to 81 ft. All were driven to uncompromising refusal

and are believed to be seated well within heavy shale.

This and other applications of steel H-piles indicate that they are well suited for reaching bottoms otherwise economically inaccessible. Where hard driving conditions exist or where great lengths (up to 100 feet) are required, CB SECTIONS warrant thorough investigation. Our representatives will be glad to give further information.

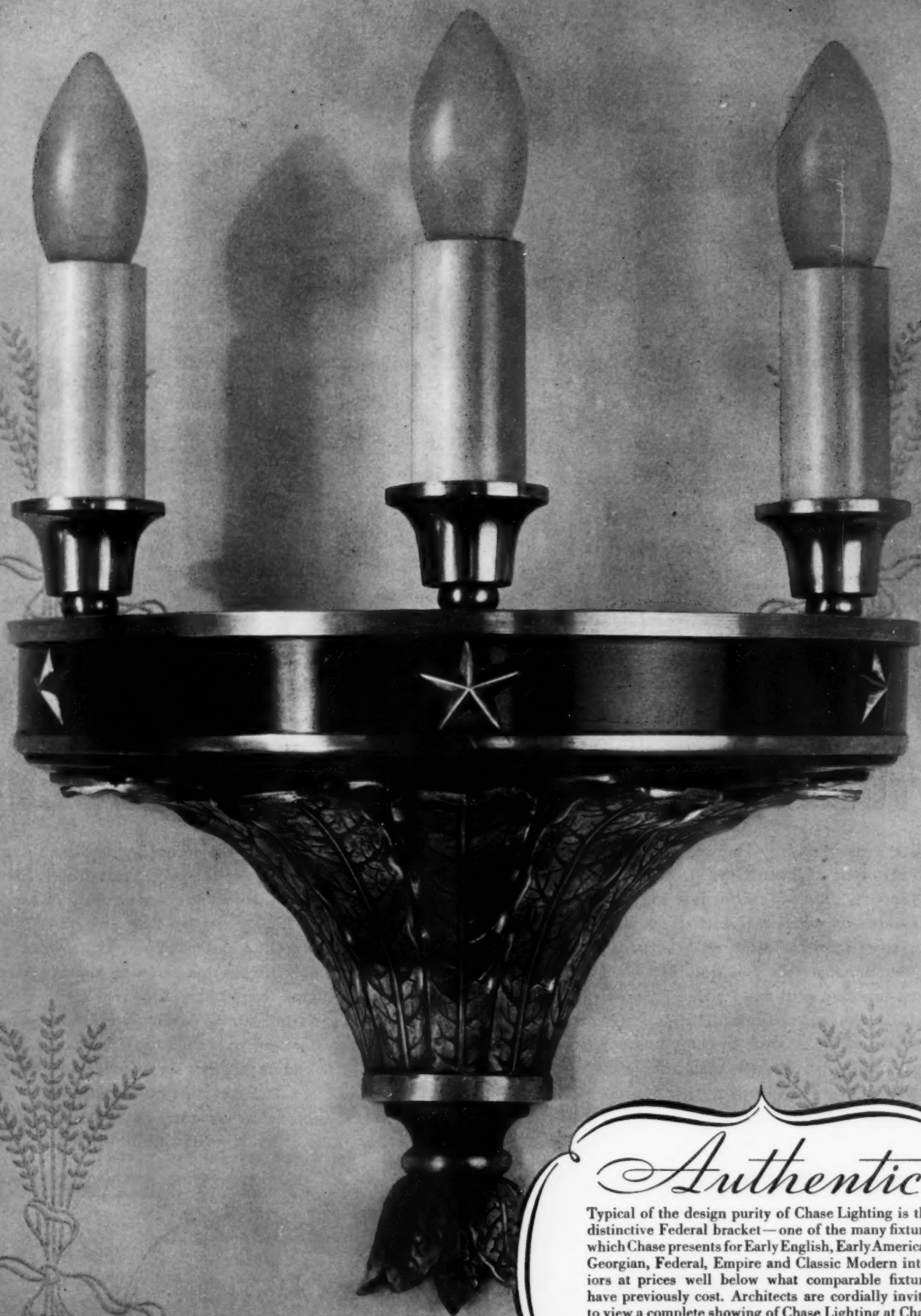
## Illinois Steel Company

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

208 SOUTH LASALLE STREET



CHICAGO, ILLINOIS



## *Authentic*

Typical of the design purity of Chase Lighting is this distinctive Federal bracket—one of the many fixtures which Chase presents for Early English, Early American, Georgian, Federal, Empire and Classic Modern interiors at prices well below what comparable fixtures have previously cost. Architects are cordially invited to view a complete showing of Chase Lighting at Chase Tower, 10 East 40th Street, New York, N. Y.

CHASE  LIGHTING





# THERE CAN BE NO QUESTION

## TONCAN IRON PIPE DOES LAST LONGER

Records of the service given by Toncan Iron Pipe in every type of installation prove conclusively that this modern alloy pipe does last longer. This statement holds true whether it is used in a plumbing or heating system in a building, in process lines in industrial plants, for supply and drainage lines on board ship, or carrying acid mine water far underground.

In the latest edition of "Pipe for Permanence" you will find the records of many comparative tests. And you will also find the technical information that explains why Toncan Iron Pipe consistently renders better service than other ferrous pipe slightly lower in cost.

Toncan Iron Pipe is the only pipe obtainable today that takes advantage of the properties of refined iron, copper and molybdenum to form an alloy that is rust-resisting to a higher degree than any other ferrous material, except the stainless alloys. It is the only pipe that combines with this rust-resisting feature the many advantages that Republic's Electric Weld Process alone can claim—100% perfect weld, straightness, roundness, uniform wall thickness, freedom from inside defects and absence of scale inside and out.

Every pipe buyer should know the facts. A copy of "Pipe for Permanence" will be sent on request.



### REPUBLIC STEEL CORPORATION

GENERAL OFFICES  YOUNGSTOWN, OHIO





## 8000 Feet of Evidence Shows the Waldorf How to Build its Bars

*New made-to-measure beverage units "follow the lead" of a mile-and-a-half of Monel Metal food service equipment in New York's most modern hotel.*

**C**HIEF of the Waldorf's public dining rooms are the Empire Room, the Sert Room and the Norse Grill.

The food served in them is prepared in kitchens outfitted with the last word in food equipment...arranged to minimize lost motion and wasted steps.

### *Splendid service record*

From oysters to ice cream, every dish is handled on, or served from, Monel Metal...shelves, cooks' tables and plate warmers.

Came Repeat...and the hotel's architects specified Monel for dispensing beverages.

The specially-built bars of the Sert and Empire rooms, the cocktail bars in the Norse Grill, the service bars in the kitchens, and the portable bars that are wheeled into the various private banquet rooms, are *all* Monel.

And why not? Nearly 8000 running

feet of Monel Metal equipment in three-times-a-day use for the Waldorf's food service testifies to Monel Metal's fitness for beverage service.

Even cooks' tables show no sign of rust or corrosion. Nothing dulls Monel's platinum-like sheen: neither charged water, ice, brine, eggs, fruit or syrups. So the Waldorf's executives concluded that Monel *must* be the best possible material for bars.

### *Strong, solid, wear-proof*

Even harsh cleansers can't mar Monel. And, since it is a solid metal, with no surface coating to chip or peel, nothing can *wear away* its good looks.

The Waldorf's five tap bars, where beer, ale and porter have been dispensed since last spring, show how Monel Metal stands up under the punishing bangs of heavy steins and seidelis.



*Monel Metal bar in the Sert Room at the Waldorf-Astoria Hotel, New York, N. Y. Duplicate of this bar is in the Empire Room of the same hotel.*

Architects retained by hundreds of other hotels and restaurants have discovered that Monel, preferred above all other materials for food service equipment, is obviously *the* metal for bars.

Actual illustrations of recent installations, and a wealth of interesting facts about beverage and service equipment for hotels, restaurants and clubs, are available to interested architects. Write for booklet "Smart Bars".

THE INTERNATIONAL NICKEL COMPANY, INC.  
67 WALL STREET, NEW YORK, N. Y.



# MONEL METAL

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.



# A hand-crafted floor-of fine terrazzo

As bright and colorful as a Navajo rug! Here's a fine terrazzo floor made with Atlas White portland cement that actually reproduces an Indian rug, with its clear, true colors and geometric design. Few rooms would need so bright a floor, but here in the Friars Club it hits just the right note. Hand-crafted, just as was the rug which this floor reproduces, these fine terrazzo floors always hit the right note because they're individually designed for each particular room. With white cement, color pigments and multi-colored marbles, any colors for any design are easily obtained. And these floors wear well and long, with minimum up-keep. See our catalog in Sweet's for details, or ask any terrazzo contractor. Or write Universal Atlas Cement Co., Subsidiary of United States Steel Corporation, 208 South La Salle Street, Chicago.

*This fine terrazzo floor, made with Atlas White portland cement, is in the Friars Club, Cincinnati. Installed by The Martina Mosaic & Tile Co. Crowe & Schulte were the architects. Both of Cincinnati.*



ATLAS WHITE PORTLAND CEMENT  
*plain and waterproofed*  
 UNIVERSAL PORTLAND CEMENT      ATLAS PORTLAND CEMENT



# The VANADOIR

## A NEW CONCEPTION IN PLUMBING FURNITURE

**Designed for Specification by  
the Architect and Installation  
by the Plumbing Trade . . .**

**T**HE VANADOIR has been created to meet the demand of architects for a greater distribution of lavatory facilities in plans for modern homes and for more practical dressing table appointments in bathrooms.

The VANADOIR is a single piece of furniture. It effects an unusual but practical combination of a well designed dressing table of fine waterproofed furniture steel, with a vitreous china washbowl and plate glass mirror giving the dressing table luxurious appointments including running water.

With no special setting required, the VANADOIR may be placed with safety and good taste on wood or carpeted floors.

The Princess Model VANADOIR is designed for average bathrooms, small dressing rooms, powder rooms and guest rooms.

The Moderne Model is designed for installation in larger bathrooms, Master bedrooms, powder rooms and women's retiring rooms in clubs, hotels and semi-public buildings.

The installation of the VANADOIR is simple and practical and meets the critical requirements of the architect.

Complete specifications, prices, construction details and typical installation data will be gladly furnished architects on request.

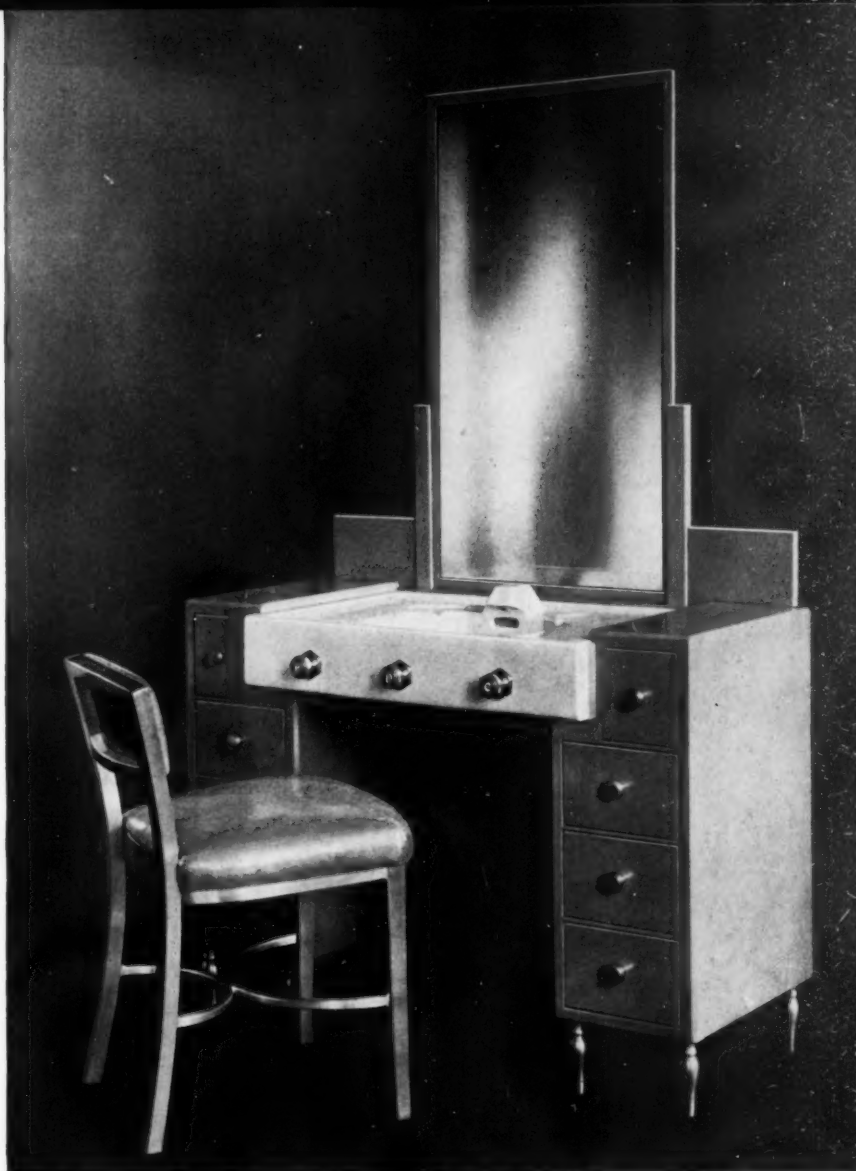
**Lady Luxury Division • Excelso Products Corp., 1807 Elmwood Ave., Buffalo, N. Y.**

Division of American Radiator—Standard Sanitary Corp.



SEE SWEET'S—SEC. D.—P. 298-299

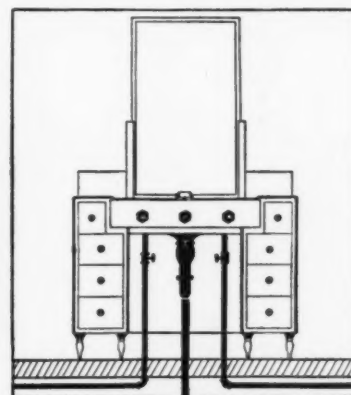
The Architectural Record, June, 1934



## P R I N C E S S M O D E L



**MODERNE MODEL**  
And Lady Luxury Chair



**PRINCESS MODEL**  
Showing Plumbing Connections

Conventional Plumbing Practice Applies to Installation of The VANADOIR. Water and waste connections are made through floor or wall as desired. Access panel beneath the lavatory completely conceals all piping.

LADY LUXURY DIVISION, EXCELSO PRODUCTS CORPORATION,  
1807 Elmwood Avenue, Buffalo, N. Y.

Gentlemen: Kindly provide us with complete data for Lady Luxury VANADOIR Combinations.

Firm \_\_\_\_\_  
Address \_\_\_\_\_  
Individual \_\_\_\_\_

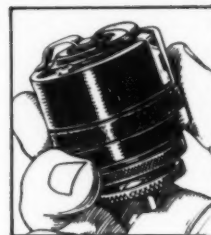




K-550—Speakman Si-Flo Closet Combination.



Speakman Si-Flo Flush Valve. Practically silent in operation. Roughs-in on standard measurements. Now being widely used to replace noisy flush valves.



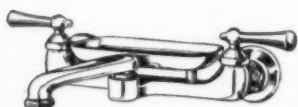
Piston unit of the Speakman Si-Flo Flush Valve — the only moving part—can be replaced in five minutes at a most nominal cost.



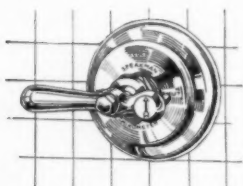
Speakman Adjusta-Spray Shower Head. Smaller than the Anystream Self-Cleaning Head, but allows the bather a choice of fine rain spray or needle bath. It is self cleaning. (Patented Nov. 3, 1931—Mar. 15, 1932—June 14, 1932).



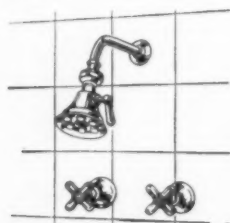
K-3395 — Speakman Anystream Self-Cleaning Shower Head. (Patented January 2, 1923 and November 3, 1931.)



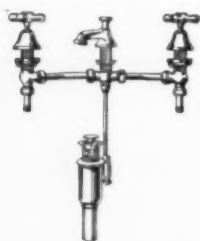
K-5503-M — Grace-Line Sink Fixture. (Design Patented.)



K-3365—Speakman Built-in Mixer.



K-2634-M — Built-in Metaline Heavywater Shower with Anystream Head.



K-5010 — Speakman Unit-Acto Lavatory Fixture.



K-4585-M—Dupont Tub Filler with Act-Easy Waste

Heavy brass castings . . . electrically melted ★ Full size waterways  
★ Clean cut threads ★ Renewable high seats ★ Swivel disc, encased washers and Chromium plate that will never wear off.

*That's what we mean by "SPEAKMAN QUALITY"*

They are Showers and Fixtures you can install . . . and forget.

SPEAKMAN COMPANY  
Wilmington, Delaware



Refer to Sweet's Architectural Catalogs, 1934 Edition, pages D-248-249-250-251

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Send your catalog on Speakman Quality Showers and Fixtures, also special literature on.....

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# BRIXMENT

## FOR

# STUCCO

THE same advantages that make Brixment superior to portland cement and lime for masonry make it equally superior to these materials for stucco!

Brixment stucco is similar in appearance, strength and wearing qualities to portland-cement stucco because, like portland, Brixment is a true hydraulic cement. It is water-proofed, increases in strength with age and withstands the test of time as only a true cement can.

The well-known plasticity of Brixment mortar permits easy application in leaner mixes. This eliminates the bad shrinkage cracks, hair checking and crazing so commonly caused by the rich mixes necessary to give portland-cement mortar the necessary working quality.

The slower hardening of Brixment mortar gives the plasterer more time to make his joinings, thus avoiding at these points the characteristic discoloration of fast-setting portland-cement stucco. The calcium stearate in Brixment gives that water-proofed quality so desirable in stucco.

The lower price of Brixment and the leaner mix make the cost of materials decidedly less than when mortar with a large content of portland cement is used. But even greater economy is obtained from the smooth-working quality of Brixment mortar which results in the faster, easier application of the stucco.

Brixment can be applied over any kind of masonry backing (brick, tile, concrete, etc.) or over any kind of metal lath or reinforcing. It should not be applied over any type of wood lath.

The proper mix for all coats is one part Brixment, three parts sand. When so mixed, four bags of Brixment will cover approximately 15 square yards of wall surface with stucco one inch thick.

LOUISVILLE CEMENT COMPANY, Incorporated, LOUISVILLE, KY.  
District Sales Offices: 228 North LaSalle Street, Chicago; 600 Murphy Building, Detroit  
101 Park Avenue, New York. . . . Mills: Brixment, New York and Speed, Indiana

BEFORE and AFTER →



## UGLY DUCKLING TO SNOWY SWAN

When you MODERNIZE,  
says architect Cameron Clark,  
give your surfaces CHARM that lasts

NEVER before has there been such widespread interest in modernization. Repeal of the 18th Amendment starts thousands of renovations in hotels, restaurants, clubs and retail stores.

Slum clearance projects in our big cities convert eyesores and public health menaces into habitations that are sightly and sanitary. Mortgagees put foreclosed properties into rentable and salable condition.

And thanks to the architect, these activities steadily raise the Nation's architecture to a broader and higher plane of excellence.

### Striking transformation at Southport, Conn.

Pictured above is a particularly interesting type of modernization project completed a short while ago at Southport, Conn. Pictured also is Cameron Clark, the architect who planned and supervised this excellent remodeling job.

The "Before" and "After" photographs quickly reveal that the architect was ably supported in this transformation by the immaculate, white surfaces of the paint job.



Maintain architectural beauty with durable paint says Mr. Clark

"In times like these," says Mr. Clark, "when properties must be operated and maintained at the lowest possible cost, the question of paint must be carefully considered from the up-keep angle."

"The architect owes it to his client to specify long-lasting paint, and he should take care to see that the paint he specifies is actually used."

"In order to provide money-saving protection, I specified pure white-lead and linseed oil for all outside work. For inside work we used the same lead mixed with flattening oil, which gives a surface that stands up under frequent washing and scrubbing."

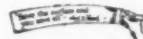
### DUTCH BOY... the Architect's Standard for years

The panels at the left show why architects prefer paint made with Dutch Boy White-Lead. Paint made with Dutch Boy doesn't crack and scale—therefore does not require costly burning and scraping at repaint time. Instead, it wears down stubbornly by gradual chalking, leaving an excellent foundation for new coats.

Dutch Boy White-Lead now comes as a quick-mixing paste that can be used for both outside gloss paint and inside flat work. For outside work you mix it with Dutch Boy Linseed Oil. For inside work, with Dutch Boy Flattening Oil.

This ALL-PURPOSE Soft Paste is Dutch Boy White-Lead of the same high quality you have always specified, changed only in form for greater convenience.

## NATIONAL LEAD COMPANY



111 Broadway, New York; 116 Oak Street, Buffalo; 900 W. 18th Street, Chicago; 659 Freeman Avenue, Cincinnati; 820 West Superior Avenue, Cleveland; 722 Chestnut Street, St. Louis; 2240 24th Street, San Francisco; National-Boston Lead Co., 800 Albany St., Boston; National Lead & Oil Co. of Pa., 316 4th Ave., Pittsburgh; John T. Lewis & Bros. Co., Widener Bldg., Philadelphia.



DUTCH BOY

After more than 3 years. Still good for lots of wear.



"CHEAP" PAINT

After 1½ years. Similar house in same Ohio city. Paint gone to pieces.



**DUTCH BOY**

*All-Purpose  
Soft Paste*

**WHITE-LEAD**

LINSEED OIL — FLATTING OIL — LIQUID DRIER — WALL PRIMER — COLORS-IN-OIL



# *The use of* CARRARA gives you new freedom in KITCHEN DESIGN

**C**ARRARA STRUCTURAL GLASS, as a material for modern kitchen walls, is extremely versatile. It imposes practically none of the limitations on design that ordinary materials often do, being adaptable to countless different methods of treatment. When you use Carrara as a wall material, you will find it a very real assistance in planning attractive, convenient kitchens.

Walls of Carrara have unusual beauty . . . because of their polished surfaces, their reflectivity, their soft depth of tone. And they are also as practical as you could wish. For

they do not check, craze, or stain. They do not change color with age, or absorb cooking odors of any kind. They are easily kept clean by merely wiping them periodically with a damp cloth. They are impervious to grease and grime . . . the terror of ordinary walls. And they are very simple to install.

Why not write for our folder containing illustrations in full color of typical Carrara rooms, together with complete information on this lovely, versatile wall material? Address Pittsburgh Plate Glass Company, 2208 Grant Building, Pittsburgh, Pa.

## **CARRARA**

*The modern structural glass*

A PRODUCT OF THE PITTSBURGH PLATE GLASS COMPANY



# *What qualities do you think*

## THE IDEAL WALL MATERIAL FOR BATHROOMS SHOULD HAVE?

BEAUTY? Carrara has it. A polished luster of surface, a bright reflectivity, a soft elegance of color-tones, a distinctive "feel" of individuality.

VERSATILITY? Carrara has this, too. An unusual adaptability to various treatments, a remarkably wide range of possibilities in the obtaining of striking effects.

PERMANENCE? Carrara lasts year after year, unchanged. It will not check, craze, stain, change color, or absorb odors.

EASE OF INSTALLATION? Carrara meets this requirement as well as the others.

It can be installed quickly and simply.

EASE OF CLEANING? An occasional wiping with a damp cloth keeps Carrara bright and dirt-free.

REASONABLE IN PRICE? Carrara is this, too. It costs very little more than inferior materials used for the same purposes.

In Carrara Structural Glass, hundreds of architects are convinced that they have found exactly the right material for good-looking, permanent bathroom walls. Why not specify Walls of Carrara Structural Glass in the next bathroom you design?

### **CARRARA**

*The modern structural glass*

A PRODUCT OF THE PITTSBURGH PLATE GLASS COMPANY





## AN IMPROVED METHOD OF BINDING

**I**N THIS ISSUE THE RECORD INTRODUCES A NEW METHOD OF BINDING INTENDED TO FACILITATE ITS USE IN THE DRAFTING ROOM AND IN THE ARCHITECT'S LIBRARY. WITH THIS BINDING THE MAGAZINE LIES FLAT WHEREVER OPENED, AND EACH PAIR OF FRONTING PAGES IS SPREAD TO THE FULL EXTENT OF ITS RECTANGLE. THIS FEATURE CAN BE DEMONSTRATED BY THE SIMPLE EXPERIMENT OF HOLDING THE MAGAZINE SO THAT IT OPENS FREELY AND THEN COMPARING THE FULL SPREAD WITH THAT OF A PREVIOUS ISSUE HAVING THE OLD METHOD OF BINDING: ALMOST 2 INCHES ARE GAINED IN WIDTH. FOR READERS WHO BREAK UP EACH ISSUE IN ORDER TO FILE SEPARATE PLATES OR ARTICLES THIS NEW BINDING SHOULD BE ADVANTAGEOUS. OTHERS WHO BIND THE RECORD IN PERMANENT VOLUMES FOR THEIR LIBRARIES ARE NOT REQUIRED TO CHANGE THEIR PRESENT BINDING SPECIFICATIONS.

*What qualities do you think*

## AN IMPROVED METHOD OF BINDING

THE IDEAL WALL MATERIAL FOR

IN THIS ISSUE THE RECORD INTRODUCES A NEW METHOD OF BINDING INTENDED TO FACILITATE ITS USE IN THE DRAFTING ROOM AND IN THE ARCHITECT'S LIBRARY. WITH THIS BINDING THE MAGAZINE LIES FLAT WHEREVER OPENED, AND EACH PAIR OF FRONTING PAGES IS SPREAD TO THE FULL EXTENT OF ITS RECTANGLE. THIS FEATURE CAN BE DEMONSTRATED BY THE SIMPLE EXPERIMENT OF HOLDING THE MAGAZINE SO THAT IT OPENS FLATLY AND THEN COMPARING THE FULL SPREAD WITH THAT OF A PREVIOUS ISSUE HAVING THE OLD METHOD OF BINDING. ALMOST 2 INCHES ARE GAINED IN WIDTH FOR READERS WHO BREAK UP EACH ISSUE IN ORDER TO FILE SEPARATE PLATES OR ARTICLES. THIS NEW BINDING SHOULD BE ADVANTAGEOUS TO OTHERS WHO BIND THE RECORD IN PERMANENT VOLUMES FOR THEIR LIBRARIES ARE NOT REQUIRED TO CHANGE THEIR PRESENT BINDING SPECIFICATIONS.



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 Maximum Capacity  
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**\$65.00**  
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**T**HE plumbing contractor who installs a Penberthy Automatic Electric Sump Pump for the removal of seepage water knows that his customer is getting the best that money can buy—but at competitive prices. Penberthy Pumps are ruggedly constructed of copper and bronze throughout—they cannot rust. They are carried in stock for immediate delivery by jobbers everywhere.

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# LEADING MINDS

*agree on this*



"THE architects and builders made careful analysis of the various types of floor construction available—and after considering all of the elements—dead load and its effect on steel and foundations, speed of construction, cost and facility with which piping and electric conduits could be placed—selected reinforced cinder concrete floor arches and fireproofing as the most satisfactory and economical." Leading minds in the architectural world agree on the above quotation taken from one of the Architectural papers. And, those with greatest experience in the use of reinforcing steel agree on the superiority of American Steel & Wire Company Wire Fabric—supplied in rolls or sheets—electric weld or triangle mesh. Satisfactory installations in the world's greatest buildings confirm their good judgment in specifying this product.

American Steel & Wire Company Wire Fabric installed on floor decking, ready for conduits and slabs.

1831



1934

## AMERICAN STEEL & WIRE COMPANY

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94 Grove Street, Worcester

SUBSIDIARY OF UNITED STATES STEEL CORPORATION  
AND ALL PRINCIPAL CITIES

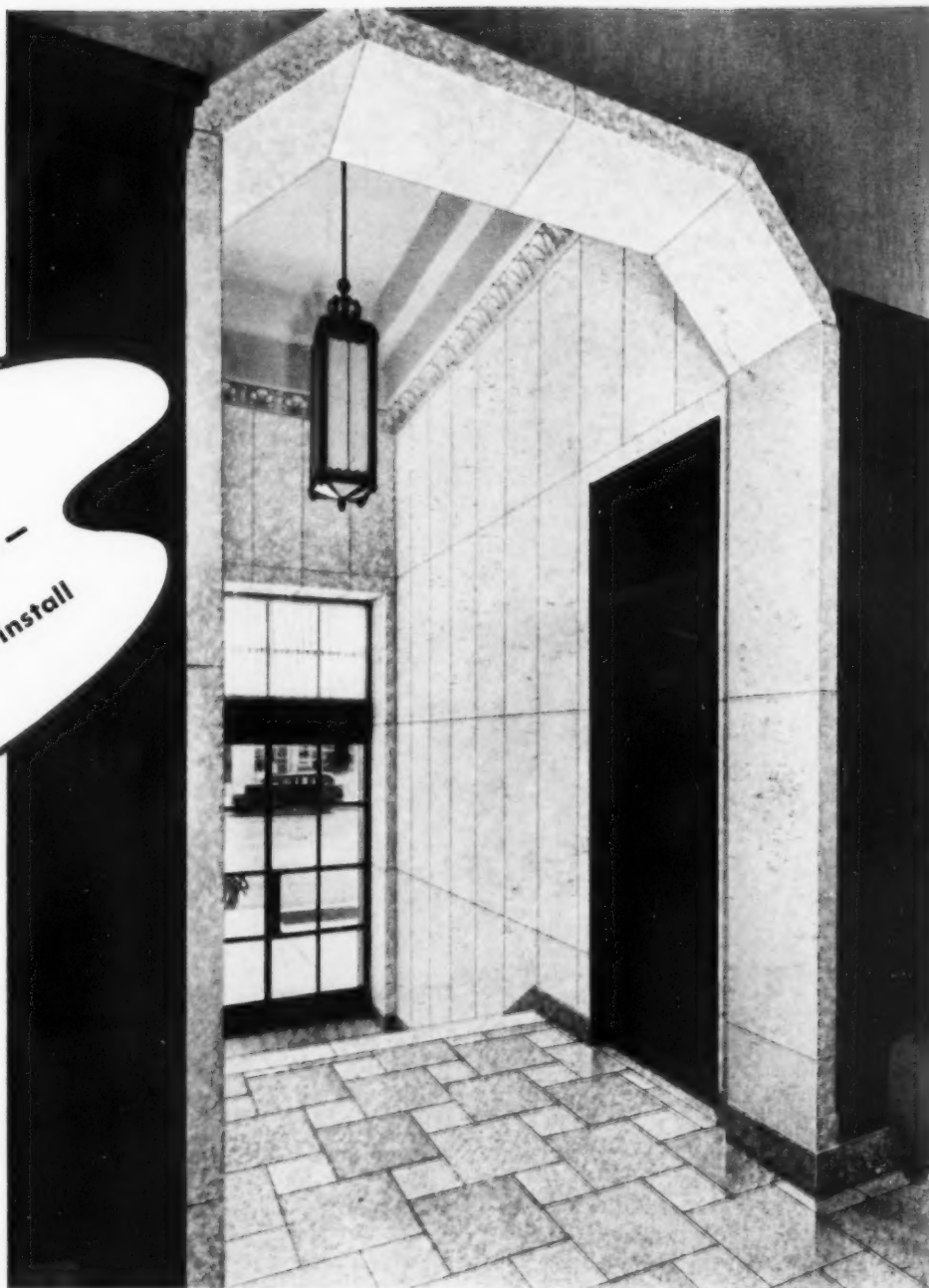
Empire State Building, New York  
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Pacific Coast Distributors: Columbia Steel Company, Russ Bldg., San Francisco

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BEAUTY  
THAT ENDURES —  
economical to install

*Zenitherm interior of the funeral parlors  
of Joseph Levine & Son, 1512 North  
Broad Street, Philadelphia. Architect:  
Edwin L. Rothschild, Philadelphia.*



**F**or interiors where beauty and economy are both important, there's nothing to equal Zenitherm. Its character, charm and quiet dignity rival the splendor of travertine, Italy's renowned natural stone. And its low cost, long life and adaptability make it ideal for floors and walls in private dwellings, schools, theatres, libraries, restaurants, department stores, churches, funeral parlors, and countless other interiors.

Zenitherm comes in 21 colors, faintly mottled. It is  $\frac{3}{8}$ ths of an inch in thickness, and there are 15 standard sizes, ranging from  $5\frac{1}{2}$  inches to 47 inches in length.

Consider its many features: Zenitherm is available in 21 softly mottled colors; it can be cut, sawed or drilled as readily as wood; it is highly fire-resistive, resilient under foot, and has remarkable sound-absorbing and insulating properties. And its cost is amazingly moderate . . . But most important of all, Zenitherm is dignified . . . durably, artistically beautiful.

zenitherm

FOR FLOORS AND WALLS

STRUCTURAL GYPSUM CORPORATION

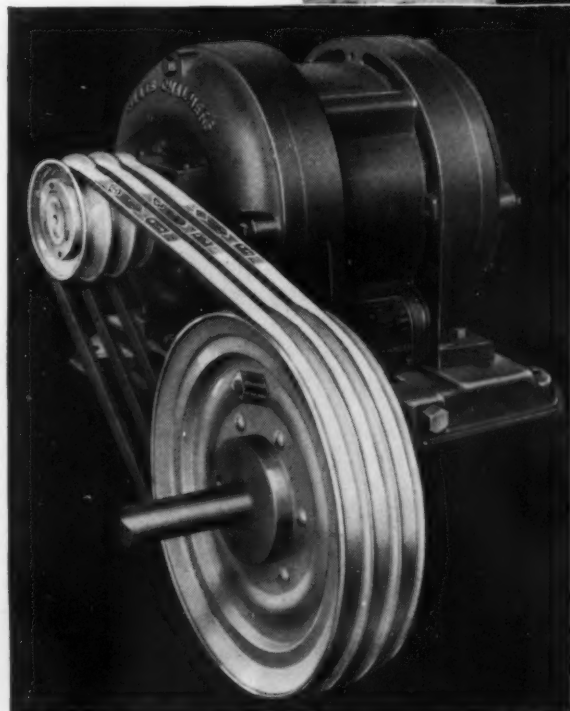
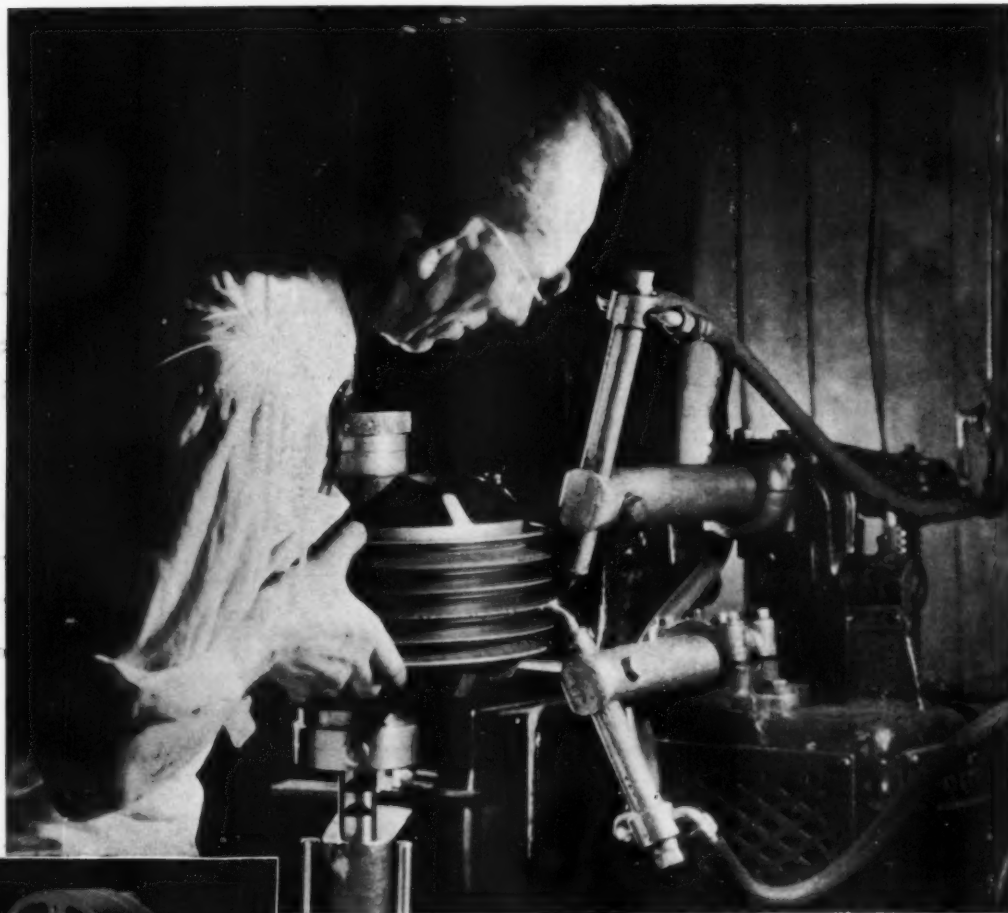
30 ROCKEFELLER PLAZA, NEW YORK

A Unit of American Cyanamid Company

# Texsteel Sheaves...

## Built for Dependability and Economy.....

Texrope Belts, made for Allis-Chalmers by B. F. Goodrich, are formed in precisely machined molds. They seat perfectly in the grooves of Texrope Sheaves.



**S**ERVICE records demonstrate the ability of Texsteel Sheaves to withstand stress and give maximum performance. Texsteel Sheaves are accurately formed of tough steel and strongly welded at the rim and web to resist shock and vibration. They are truly rigid in construction—light in weight and accurately balanced to assure maximum efficiency. They are attractively finished in a high grade aluminum lacquer which provides for permanent protection. Short center Texsteel Texrope Drives are low in cost and are available for ratios up to 7 to 1 and for ratings up to 15 horsepower. They have the approval of thousands of users in many industries. On account of their advantages and economies, Texsteel Texrope Drives are accepted as standard equipment by machinery manufacturers.

ALLIS-CHALMERS MANUFACTURING COMPANY  
MILWAUKEE, WISCONSIN

INSIST ON **TEXROPE**  **DRIVES** GENUINE

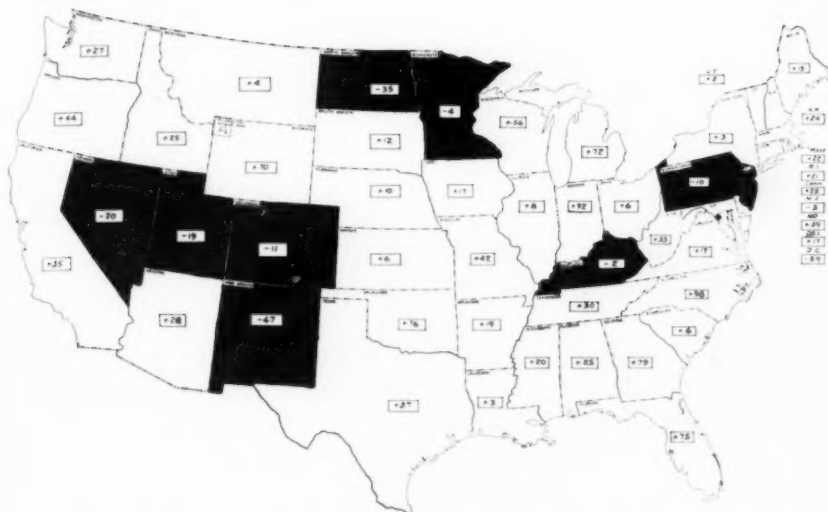
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BY ALLIS-CHALMERS MFG. CO.



# BUILDING TRENDS AND OUTLOOK

BY L. SETH SCHNITMAN  
CHIEF STATISTICIAN  
F. W. DODGE CORPORATION



BUILDING DURING 12 MONTHS — MAY, 1933 - APRIL, 1934, INCLUSIVE. Corresponding twelve months ended April, 1933, taken as base. SHADED AREA: BELOW BASE. UNSHADED AREA: ABOVE BASE. Figures denote percentage change from base. Floor space for new building contracts, 37 states east of the Rocky Mountains. Permit valuations for Rocky Mountain and Pacific coast states. Map, copyright American Map Co., N. Y. Authorized reproduction No. 5025.

## PUBLIC PROJECTS

## DOMINATE CONSTRUCTION

## MATERIAL PRICE MEASURING ROD

### F. W. DODGE CORPORATION COMPOSITE PRICES

MATERIAL	This Month	Month Ago	Year Ago
Portland Cement . .	\$2.30	\$2.30	\$2.08
Common Brick . . . .	12.30	12.36	11.72
Structural Steel . .	1.65	1.65	1.60
Lumber . . . . .	16.45	16.48	15.51

The prices in this tabulation enable one to visualize at a glance the main trend of the material market. Their significance does not extend beyond that point, and the explanation should be read carefully. Prices given in this comparison are composite and do not in all cases refer to one item. For instance, the price of structural steel is the composite of prices of shapes and plates f.o.b. Pittsburgh; the price of lumber is a composite of five items of Southern pine and five items of Douglas fir f.o.b. mill; the price of cement is a composite of prices in fourteen different cities per barrel, carload lots, to contractors; price of brick is composite in fourteen cities per M. delivered on the job.

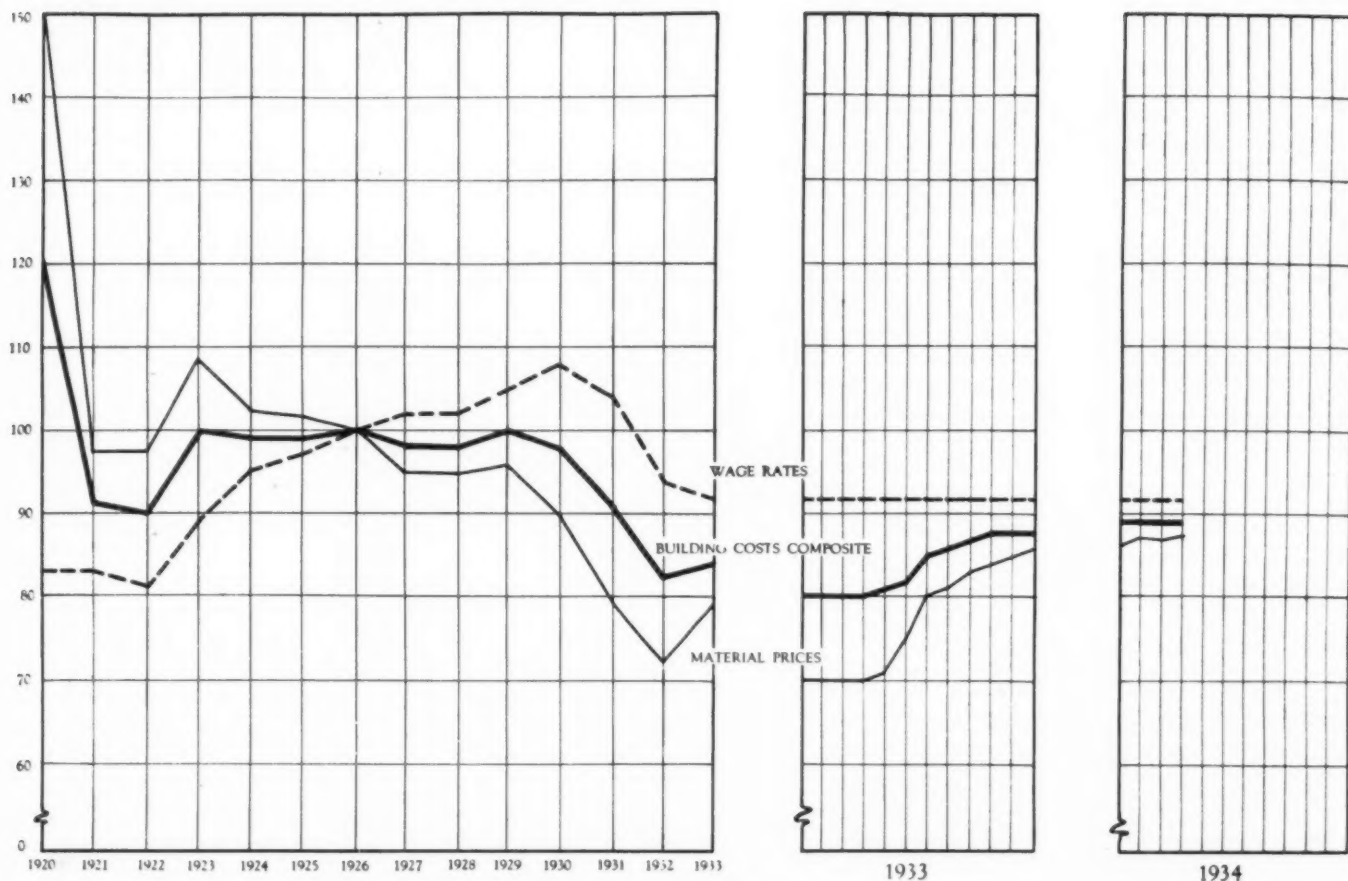
Construction contracts awarded during the initial half of May were below the April rate but were maintained at a volume sizably greater than was recorded during the corresponding period of 1933.

For April the construction contract total amounted to \$131,329,500 for the 37 states east of the Rocky Mountains. This contrasts with \$178,345,800 for March and only \$56,573,000 for April, 1933. For the period from January 1 through May 15, 1934, contracts for all classes of construction awarded in the 37 eastern states totaled \$655,421,700 as against only \$294,315,200 for the corresponding period ended May 15, 1933.

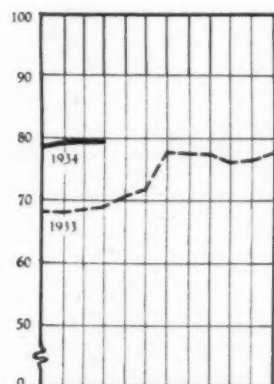
Of the contracts let thus far this year about 70 per cent were for publicly-financed construction projects, chiefly under the PWA allotments. During the corresponding period of 1933 publicly-financed contracts accounted for only 40 per cent of the total construction awards reported. In actual contract values both publicly-financed and privately-financed projects exceeded their respective cumulative totals for the corresponding period of last year; the former was four times the volume of 1933; the latter, i. e., privately-financed awards, showed an increase of somewhat less than 20 per cent.

Governmental agencies are now directing their recovery efforts to the field of residential building. Awards for this class of building during the initial half of May were decidedly disappointing, having fallen below the volume for the corresponding period of 1933.

For the year 1934 to date, residential contracts were about 30 per cent ahead of the total for the like period of 1933. But it does not appear likely that this lead can be maintained for the remainder of the year unless outside stimuli are brought into play. A broad modernization program would doubtless be of some aid but remedial legislation on home financing, however desirable, can do little to stimulate new building until the present abnormal spread between construction costs and real estate prices is narrowed materially.

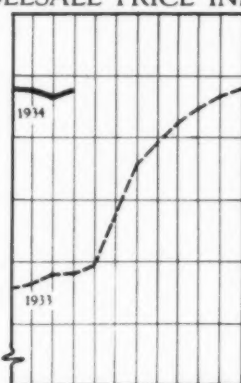


### WHOLESALE PRICE INDEXES



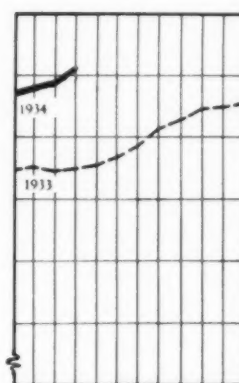
#### PAINT MATERIALS

The rising trend of prices, recently in evidence, appears to have approached a definite resistance level for the time being.



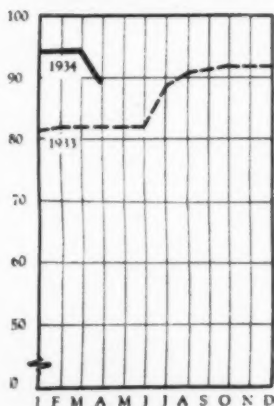
#### LUMBER

Further important rises in lumber prices are not likely in near future. Current conditions indicate a weakening price structure over next three months.



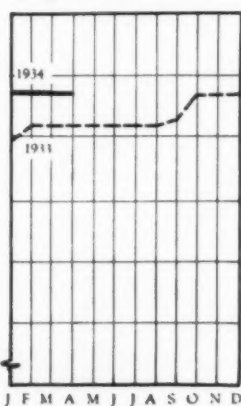
#### BRICK AND TILE

Prices for clay products are unwarrantedly high in light of current conditions of supply and demand. Some easing of prices appears probable in near-by months.



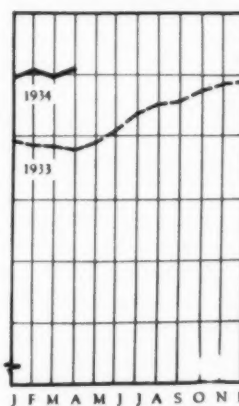
#### CEMENT

The peak of cement prices for 1934 appears to have been passed. For the third quarter of 1934 cement prices will likely fall below the corresponding level of 1933.



#### STEEL

From the point of view of current activity in heavy construction there is little to warrant the present high level of prices for structural shapes.



#### OTHER MATERIALS

Most other building materials are now at a price level where important buyer-resistance can be expected.

1926 MONTHLY AVERAGE = 100

### MATERIAL PRICES, BUILDING WAGE RATES AND BUILDING COSTS COMPARED

# HOW MANY TELEPHONE OUTLETS ARE ENOUGH?



Six built-in outlets, including one in the basement, provide for telephone convenience in the residence of Mr. Jay A. Johnson, 2101 Wiggins Avenue, Springfield, Illinois. BULLARD & BULLARD, architects, Springfield.

It's sometimes difficult to determine what telephone facilities will best serve the owners of a residence you're planning. It's even harder to foresee how the demands of that household will change with the years.

That's where the specialized knowledge of your telephone company can be useful. Trained engineers will help you provide for the right number of telephones at the right locations. Perhaps they'll suggest recessed bell boxes, or intercommunication between master bedroom and pantry, or some other of the many types of telephone equipment designed for convenience and comfort. These are *immediate* needs.

They can advise you also in placing other telephone outlets to anticipate *future* requirements. Extra outlets and connecting conduit add very little to construction costs and add *nothing* to the monthly telephone bill until used. But they're *there*—ready—and whenever occasion arises, telephones can be plugged in easily and quickly — without tearing up floors or walls — without exposing wiring.

Your telephone company will co-operate with you at any time on any of your projects. No charge. Just call the Business Office and ask for "Architects' and Builders' Service."





# NEW MATERIALS & EQUIPMENT

## NEW CATALOGS

## RESEARCH REPORTS

## MANUFACTURERS' LITERATURE

Architects are invited to use the coupon on this page as a convenient means of obtaining manufacturers' publications describing in detail the products and materials mentioned

### F1

#### STEDMAN ANNOUNCES INNOVATION IN RUBBER FLOORING

In answer to a need for a rubber tile floor at prices in keeping with present day hospital budgets, the Stedman Rubber Flooring Company, South Braintree, Massachusetts, has introduced Reinforced Rubber Tile Floors of  $\frac{1}{8}$ " thickness.

Previous to this, rubber floors have been available only in  $\frac{3}{16}$ " and  $\frac{1}{4}$ " thicknesses according to manufacturers' statement. This new gauge material employs exactly the same formula, having the same characteristics as the heavier grades. It is said to be foot-sure, odorless, resilient, easily cleaned and highly resistant to abrasive wear, staining and burning. It is available in the same wide range of colors but at a decided saving in cost, and can be quickly installed over wood or concrete sub-floors. Complete information and samples will be gladly furnished on request.

### F2

#### ELECTRUNITE STEELTUBES

A new type of conduit having a ball bearing surface that greatly reduces wire pulling friction, is the latest development of the Electrical Division of Steel & Tubes, Inc. The inside of this new conduit, which is called Electrunite Steeltubes, is processed, prior to forming and welding, so that the entire surface is covered with small, round, raised knobs which produce what the manufacturer refers to as a ball bearing surface. It is claimed by the manufacturer that this type of contact surface reduces the surface friction 30%, requires less time and reduces chances of jamming in the pulling of cables. No threading is required in the installation of this conduit, and it is said to cut and bend more easily than the old style conduit.

### F3

#### WALSEAL THREADLESS BRONZE FITTINGS

A new threadless bronze pipe fitting has been perfected through the collaboration of the Air Reduction Sales Company, Walworth Company and Handy & Harmon. This fitting



will be manufactured exclusively by the Walworth Company. It incorporates in each opening of the fitting a ring of brazing alloy, known as Sil-Fos. Installation consists merely of slipping the pipe into the fittings, then applying the oxy-acetylene flame until the white Walseal ring appears, as shown in the illustration, between the pipe and the fitting outlet. The Sil-Fos flows out between the fitting and the pipe in both directions from the ring. The proper quantity of Sil-Fos is included in each outlet. There can be no clogging of the line due to an excess of brazing alloy. It is impossible to use the wrong type of alloy and it is impossible to overheat the brazing alloy.

Should it be necessary to remove the fitting it can be used again by merely repeating the operation employed in making the original joint because there is sufficient Sil-Fos to make two complete joints. The finished Walseal joint, according to the manufacturers statement, has been proven by repeated tests to be stronger than the pipe itself. It is vibration proof, resists corrosion and will not creep. It cannot pull apart under any temperature to which bronze or copper pipe can safely be subjected.

### F4

#### METAL FLORDUCT

Metal Florduct, a new product announced by the National Electric Products Corporation, consists of two pieces—base and capping—so formed as to "snap" together by means of concealed fastening means in the base. It is of neat, convenient proportions, standing just  $\frac{5}{16}$ " in height, with a gradual sloping ramp-like plate extending to the floor surface covering a width of  $1\frac{1}{2}$ ". It is designed to accommodate popular requirements and takes circuits for two or three telephones, or wires of a half dozen buzzer circuits or the like.

The Metal Florduct system consists of an outlet extension cap which can be used between an existing floor outlet and a run of Florduct to a new location; an internal adapter elbow to be used as a junction between Florduct and a baseboard wiring system; and a service fitting through which the wires are extended at the termination of the duct.

## To Obtain Further Information

about any products mentioned, write the index numbers in space below. For literature about products advertised in this issue, give name of the product and manufacturer. Return coupon to The Architectural Record, 119 West 40th Street, New York, N. Y.

Name \_\_\_\_\_

Position \_\_\_\_\_

Street \_\_\_\_\_

City and State \_\_\_\_\_

## A THREE-YEAR SCOVILL SERVICE RECORD

THE strongest arguments in favor of Scovill installations are the trouble-free service records that come to us year after year from all types of jobs. Here is what the Building Engineer of New York City's *Commerce Building* writes about the Scovill installation there:

*"Having been in charge of maintenance of mechanical equipment on this building since it was completed in 1931, I am pleased to report that the 300 Scovill Flush Valves have given perfect service; with no repairs or replacement of parts. Those responsible for the selection of Scovill Valves for this building have my sincere thanks for their wise choice in such an important part of the equipment."*


*Edward Boshka*

Commerce Building  
155 East 44th Street, New York City

Architect: ELY JACQUES KAHN, New York City.

Plumbing Contractor: JARCHO BROS., New York City.



**SCOVILL MANUFACTURING COMPANY**  
PLUMBERS' BRASS  GOODS DIVISION

**Waterville**  **Connecticut**

Scovill Flush Valves, Shower, Bath, and Lavatory  
Fittings; Miscellaneous Plumbers' Brass Goods

# SCOVILL

The Architectural Record, June, 1934



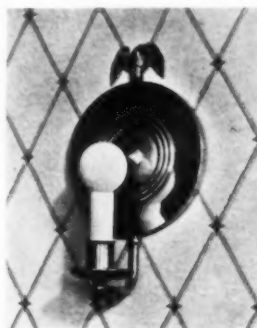
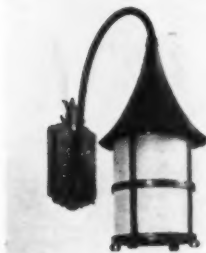


The Brompton  
GEORGIAN

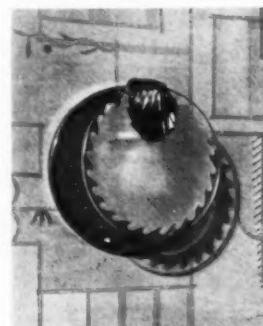


The Hampton  
EARLY ENGLISH

(Right) The Haddon Hall  
EARLY ENGLISH



The Fontainebleau  
EMPIRE



The Thessaly  
CLASSIC MODERN

(Left) The Concord  
FEDERAL

The Chase Brass & Copper Company is now producing a new and complete line of residential electric lighting fixtures. Included among the varied designs are those representative of the Early English, Early American, Georgian, Empire, Federal, Classic Modern, American Adaptations. According to the manufacturer's statement all fixtures are of pure design, authentically styled. A nationally prominent designer was commissioned to create these fixtures in entirety. None of the parts used is assembled, all being manufactured by the Chase Company. The use of color in fixtures, a characteristic of the original fixtures of these periods, has been revived.

To facilitate the purchase of this new line of fixtures Chase announces a deferred purchase plan through financing by Commercial Investment Trust.

## F6

## MOTOR WHEEL CONVERSION BURNER

A low-price pressure-atomizing type conversion burner has just been added by the Heater Division of Motor Wheel Corporation to its already diversified line of oil burning cooking ranges, bake ovens, water heaters, circulating heaters, boiler-burner units and other oil burning utilities.

Identified as the New Emancipator, the burner

is furnished in one model flexible enough to meet all domestic heating plant requirements. Important advantages cited include aluminum casings of modern stream-line design and smartness, smooth quiet operation due to a built-in silencer, radio interference eliminator, no hot or moving parts exposed, ease of installation, economy in operation, and the finest standard controls and accessories.

Complete information is available on request.

## UNDER THE FLOOR

There may be a maze of drains and you may safely cover them over with concrete, if they are Duriron.

THE DURIRON COMPANY, Inc.

404 N. Findlay Street  
DAYTON, OHIO

See Our Catalog in Sweet's

# DURIRON

## ACID PROOF

# DRAIN PIPE



If you are driving for complete satisfaction  
all-around...your own as well as your client's  
...you will find that a closed specification  
for L·O·F Improved Quality Glass (*brighter,  
clearer, flatter*) will help you reach the green.

LIBBEY • OWENS • FORD GLASS COMPANY, TOLEDO, OHIO.  
Manufacturers of Highest Quality Flat Drawn Window Glass, Polished  
Plate Glass and Safety Glass; also distributors of Figured and Wire  
Glass manufactured by the Blue Ridge Glass Corp. of Kingsport, Tenn.

LIBBEY • OWENS • FORD  
QUALITY GLASS



# THESE



Architect's drawing of Knickerbocker Village, New York City. All steel in the framework of this project furnished by Bethlehem Steel Company. Bethlehem Light Sections used as intermediate floor members. . . Fred F. French Co., General Contractors; Harris Structural Steel Company, Fabricators; John S. Van Wart, Architect; Alexander D. Crossett, Structural Engineer. At right: Portion of steel framework, Knickerbocker Village.



## PROPERTIES OF BETHLEHEM LIGHT SECTIONS

Section No. and Nominal Size	W <sup>g</sup> /t per Foot Lb.	Axis X-X S In. <sup>2</sup>	Section No. and Nominal Size	W <sup>g</sup> /t per Foot Lb.	Axis X-X S In. <sup>2</sup>	Section No. and Nominal Size	W <sup>g</sup> /t per Foot Lb.	Axis X-X S In. <sup>2</sup>
*B 12 L { 22 19 16 1/2 } 12 x 4	25.3 21.4 17.5	*B 6 L { 16 12 8 6 } 6 x 4	10.1 7.24	*B 5 4 { 13 10 7 1/2 } 4 x 4	5.45 4.16 3.13			
*B 10 L { 19 17 15 } 10 x 4	18.8 16.2 13.8	*B 6 { 8 6 } 6 x 6	41 30 27 23 20	27.0 19.8 17.6 15.1 13.1	*B J 12 14 11 1/2 10 8 6	14.8 10.5 7.79 5.07		
*B 8 L { 15 13 } 8 x 4	11.8 9.88	*B 5 6 { 18 15 1/2 } 6 x 6	11.7 10.0					

\*These shapes have flange slope of 2 per cent; all others have parallel-faced flanges.

# BETHLEHEM

# LIGHT SECTIONS

*bring  
decided economies*

BETHLEHEM LIGHT SECTIONS, including beams, columns, joists and stanchions, supplement Bethlehem's line of heavier sections, and give architects and engineers far greater selection in working out economical designs.

In floors, Bethlehem Light Sections, of depth sufficient to give the requisite rigidity, can be set close enough together to keep the floor slab thickness within economical limits without using a greater weight of steel than is needed to carry the load.

Similar savings are obtained through the use of Bethlehem Light Sections as purlins in roof construction, as columns in upper stories where loads are lighter, as struts between columns—in fact, wherever it is desirable to combine rigidity with relatively close spacing of the structural members in floors and roofs.

Bethlehem Light Sections are finding wide application in apartment houses, school buildings, hospitals, hotels and similar

structures having relatively lighter live load requirements in floors.

Bethlehem Light Sections have application also in floors for dwellings, wherever fireproof construction is desired.

Are you taking advantage of the opportunities they offer for decided economies in building costs?

\* \* \*

## *Advantages of Bethlehem Light Sections*

In addition to the important feature of economy, Bethlehem Light Sections have the following advantages:

1. The light structural joists together with stanchions, forming an integral part of the steel frame, offer economy in design without loss in rigidity.
2. They are erected in the same manner as the heavier sections comprising the steel framework, and therefore can be handled by the same contractor or fabricator who has the complete job.
3. Bethlehem Light Sections have sufficient lateral strength that bridging and cross-bracing problems are minimized.
4. Bethlehem Light Joists will support loads, such as forms for floor slabs, before the floor is in place.
5. With Bethlehem Light Sections a thicker floor slab is possible, when desired, than with other light sections, without placing the joists unnecessarily close together.



# LIGHT SECTIONS

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.







## When is the contract fulfilled?

Legally, when the parties to it have done everything they agreed to do. But the manufacturer whose name on a piece of machinery has stood for quality and dependability for a half century or more, knows that his product must meet an implied obligation long after the technicalities of the contract are forgotten. Year after year it must perform at high efficiency and with low maintenance expense . . . year after year it must provide dependable and trouble-free service . . . year after year, throughout a long life of usefulness it must fulfill the unwritten guarantee which its name carries with it.

YORK ICE MACHINERY CORPORATION • YORK • PENNSYLVANIA



REFRIGERATION • AIR CONDITIONING  
MILK & ICE CREAM PLANT EQUIPMENT

### F7

#### PORTABLE TESTING MACHINE FOR WELDING WORK

The delay and complexity of shipping weld specimens to testing laboratories have brought about a demand for a compact, accurate and portable testing machine for use on the job. In answer to this demand the Air Reduction Sales Company has developed the Airco Portable Tensile and Bend Testing Machine, which is a compact, comparatively light machine that can be carried to the welding job

so that welded specimens can be tested on the spot, rapidly and easily. The load on the test specimens is indicated on a 6-inch pressure gauge of special construction, carefully calibrated against a standard deadweight tester. The gauge is designed to maintain its accuracy under strains of usage and shipping. The entire unit, machine and case, weighs only a little more than 200 pounds and can be handled freely without damage to the machine.

### F8

#### DESIGN SPECIAL LAMP

As an outgrowth of disclosures of a survey conducted by the Industrial and School Lighting Committee of the Illuminating Engineering Society a lamp of special design for the study rooms of college dormitories and fraternity houses is being recommended. The new design has an inverted bowl of translucent glass, open at the top, and produces a combination of direct and indirect illumination. The Standard 100-watt Mazda Lamp which is specified for the I. E. S. Study and Reading Lamp, is somewhat larger than that generally found in such lighting units. Surface brightness of the light source, however, is kept below three foot-candles per square inch by the translucent glass of the bowl. The underneath surface of the shade is sprayed with a white enamel which has a high factor of reflection that contributes to efficiency of light production. Intensity of illumination produced on the study desk in the immediate vicinity of the lamp averages 30 foot-candles. The enamel coating on the shade also has a diffusing character that adds to the softness of illumination.

Removing the sharp contrast between the bright spot of illumination on the desk top and dark shadows in the remainder of the room is expected to be an important factor in combating eyestrain. Eyes are spared the continual readjustment which tires muscles and induces strain. With a height of 28 inches, the I. E. S. Study and Reading Lamp is considerably taller than most designs.

### F9

#### SIGHT METER

A device called Sight Meter, produced by the Sight Light Corporation of New York, indicates, on a dial, the light intensity of a given location. It is a pocket-size instrument operating on the principle of the batteryless photo-electric cell. It records light intensities ranging from zero to 500 foot candles. The manufacturer claims that the Sight Meter is an efficient aid in the determination of natural and artificial lighting provisions for new or remodeled structures.



# Science Discovers

## A MORE EFFICIENT WAY OF HANDLING AIR

**V**ENTILATING fans, for many years, have looked almost alike. They have been constructed with propeller type blades that resemble an airplane propeller or with curved paddle blades. Increases in efficiency have been made by increasing the speed, increasing or decreasing curves and other changes of existing design.

This new American Blower Ventura Fan is a radical departure from all conventional designs—blades are neither airplane type nor paddle shaped. Yet, new standards of efficiency have been created. So much so that conventional fans, even though they are operating at their highest efficiency, can profitably be replaced with new Venturas.

Quietness in operation, too, has been developed to a point heretofore considered impossible. A new Ventura Fan calibrated by a machine that will record the noise created by the walking of a small cockroach, registers only from 38 to 42 decibels of noise at top speed. A laboratory

without any humans in it and with all machinery and equipment motionless, creates 20 decibels of noise.

Spring suspension, patented and designed by American Blower engineers, permits a full floating motor. A streamline inlet ring serves as both fan inlet and discharge outlet and further adds to the high efficiency of the unit.

Ventura Fans are made in various sizes to handle all types of ventilating and exhausting in stores, offices, restaurants, garages, factories and shops. They can be easily and quickly installed and will give years of satisfactory service at the lowest possible cost. For complete data on Ventura Fans, air conditioning or any type of air handling equipment, mail the coupon below.



(1936)

AMERICAN BLOWER CORPORATION, 6000 Russell Street, Detroit, Michigan. BRANCH OFFICES IN ALL PRINCIPAL CITIES

Please send data on new Ventura Fans ☐ Air Conditioning Equipment ☐ Air Handling Apparatus for \_\_\_\_\_ ☐

Name \_\_\_\_\_ Address \_\_\_\_\_

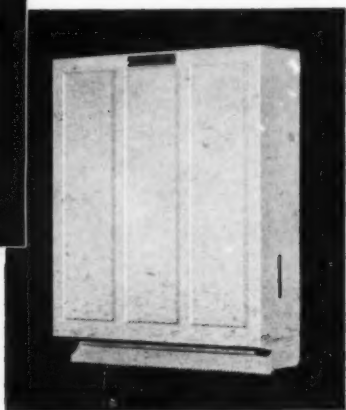


G. C. Polk, Chief Engineer of the American Blower Corporation, watches a speed test on the new Ventura Fan. New scientific design makes possible the delivery of from 20% to 60% more air than ordinary disc fans.



The most sensitive noise recording instruments prove the new

# A FIRST CLASS CHOICE



## FOR ANY BUILDING

When it comes to washroom appointments, there's one choice that will meet your clients' approval every time. A.P.W. Onliwon Towel and Tissue Cabinets. This washroom service is in daily use in hotels, clubs, offices, factories, schools and hospitals in virtually every city in the country. Your clients know these towel and tissue cabinets with the intimacy that comes from constant use.

Onliwon Cabinets are available in the right sizes and materials to harmonize with the fixtures of any washroom from the most utilitarian to the most ornate. They are sturdy and simple to use. They give definite protection against theft and soiling from promiscuous handling. They prevent waste and unnecessary litter. Send today for a catalogue giving full details on all our cabinets—surface and recess, metal and solid porcelain. A. P. W. Paper Co., Albany, N. Y.



A. P. W. Paper Company, Albany, N. Y.

Please send me the latest and complete catalogue of A. P. W. Cabinets and Fixtures.

AR-6-34

Name .....

Address .....

City ..... State .....



### F10

#### ROOM COOLERS AND AIR CONDITIONERS

The new and redesigned General Electric line of air conditioning products for domestic and commercial use includes portable room coolers, floor-mounted room coolers, wall-mounted room coolers, and suspended-type store coolers; three new types of room air conditioners; and a complete line of condensing units ranging from 1/2 to 20 horsepower in size. The 1 1/2, 7 1/2, 15 and 20 horsepower units are new additions to the line of condensing units offered last year.

Floor and Wall-Mounted Room Coolers use a new aphonic pressure-type, propeller fan and have hour respectively. The floor-mounted unit is styled in the set-back motif; the wall-mounted unit is rectangular with rounded corners. Each is finished in dull satin walnut, and is equipped with ornament grills through which the air is discharged. The function of these units is to cool, dehumidify, and circulate the air.

### F11

#### NEW OTIS FREIGHT ELEVATOR

A new improvement in freight elevators, known as Dualite Control, is announced by the Otis Elevator Company. It is an improved type of constant-pressure, push-button control for slow-speed freight elevators. Operation from within the car is by means of an up button and a down button. At the landings, however, there is but one button for calling the car, and when this button is pressed the car moves either up or down to that floor, where it automatically stops.

The button plate at each landing is provided with two lights, one red and the other green, from which the new type of control takes its name. The red light is marked "Car Moving," and indicates that the car is in use. The green light is illuminated at any floor at which the car stops, and shows that the doors at that floor may be opened. All lights are extinguished when pressure of a button is released. The new control system has several advantages over older types. It is not necessary to know whether the elevator is above or below a floor before calling the car. The car automatically stops at the floor when it is called by pressing a landing button. Vision panels are not required in hoistway doors. Prospective users are saved time and annoyance by knowing whether or not the elevator is available for service.

### F12

#### THE WESTINGHOUSE MOBILAIRE

A four page illustrated folder describing the uses and features of the new Westinghouse self-contained summer air conditioner is released by the Westinghouse Electric & Manufacturing Company. The unit, known as the Westinghouse Mobilaire, is especially useful in dentist's and doctor's offices, in homes and similar small spaces of 150 to 300 square feet area.



# AGAIN "Standard" LEADS IN Bath Design



## "Standard" NEO-ANGLE BATH \$104.85\* *complete*

THE "Standard" Neo-Angle Bath is as new and different as the streamlined automobile... yet it is the most sensible and practical bath ever designed! It is approximately 4 feet square and 16 inches high, comes in a variety of colors, offers unlimited opportunities for unusual bathroom interiors. Its tub runs diagonally, has a bathing space equal to that of a 5½ foot tub. And on either side of it, in two opposite corners, are roomy,

comfortable seats that provide facilities for every type of bathing.

Thousands of home owners, interested in modernization, are visiting the "Standard" showrooms to see the Neo-Angle Bath. It is creating new interest in bath design. See it yourself at the nearest "Standard" showroom. Or write today for complete specifications and literature.



## Standard Sanitary Mfg. Co.

PITTSBURGH, PA.



Division of AMERICAN RADIATOR & STANDARD SANITARY CORPORATION

\*Price includes bath in white regular enamel, complete with No. 6 chromard all-metal bath and shower fitting. Plus local delivery and installation by your registered master plumber. Time Payments Available.

PRICE SUBJECT TO  
CHANGE WITHOUT  
NOTICE

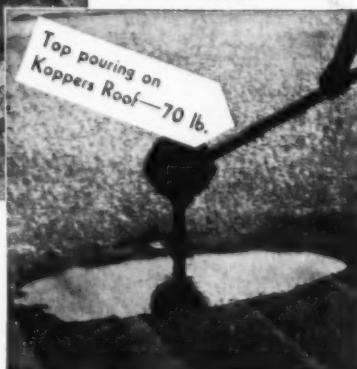
© 1934 By S. S. M. Co.

# NO. 5 ROOFING FAILURES



(Above) This roof may need re-coating in 5 years

(Right) This roof will probably serve 15 to 25 years without attention.



THESE photographs illustrate a frequent cause of roofing failures.

The top coating of most smooth-top roofs is mopped on and is usually about 30 lbs. per square. But the top coating of a Koppers Roof is POURED on (not mopped), and is more than twice as thick.

To find the real cost of a smooth-top roof, add to the bid-price the cost of the re-coating which will probably be necessary in 5 years.

Other reasons why a Koppers Roof is a safer investment: (1) the felt contains 3 times as much bitumen as the felt in some smooth-top roofs; (2) the Koppers Roof, with its slag or gravel surface, is 2 to 3 times as thick; (3) it has the property of healing any cracks that may occur; (4) it remains free from "buckles," "blisters," "cheesiness."

FOR ROOFING OR RE-ROOFING, specify

1. KOPPERS COAL TAR PITCH

2. KOPPERS COAL TAR SATURATED RAG FELT

3. AND A GRAVEL OR SLAG SURFACE

**KOPPERS PRODUCTS COMPANY**

KOPPERS BUILDING - PITTSBURGH, PA.

Birmingham - Boston  
Chicago

**KOPPERS**

New York - Providence  
St. Louis

OTHER KOPPERS PRODUCTS: Membrane Waterproofing; Dampproofing; Tar Aluminium Paints; Plaster Bond Paints; Tarmac Road Tar for Streets, Pavements, Drives, Highways.

KOPPERS PRODUCTS CO., Pittsburgh, Pa.  
Please send me the "Do's and Don't's" Folder.

A.R.

Your Name.....  
Address.....

## F13

### MASONITE TEMPRILE

Temprtile is an all-wood material that comes in sheets and can be cut or sawed to fit required space. It is used for bathrooms, kitchens, hallways, solariums, terraces, banks, public buildings and a variety of other applications. Per square foot it is said to be low in cost compared with ceramic tile. Temprtile can be used in its natural form, brown in color, or in finished form in any color. Paint can be applied on the job or, if desired, Temprtile can be obtained with finish already applied.

## F14

### ALLIS-CHALMERS MOTORS

The Allis-Chalmers "Type AR" Squirrel Cage Induction Motors are described in a fully illustrated leaflet being released by the manufacturers. Among the advantages claimed for these motors are: (1) the frame is of high carbon, cast steel with the feet cast integral. (2) The stator core is twistless, distortionless and self-supporting. (3) The squirrel cage rotor is indestructible, with bars silver brazed to end rings. (4) Ball bearings are mounted in dust-tight cartridges. (5) Effective enclosure of sleeve bearings prevents the entrance of dust and dirt and the escape of lubricant. (6) Windings are mechanically protected and are acid and moisture resisting. (7) Conduit box is adjustable for four positions. (8) Values of performance, such as efficiency, power factor, torque, temperature rise, etc., meet the standards of the American Institute of Electrical Engineers and the National Electrical Manufacturers Association.

## TRADE ANNOUNCEMENTS

### THE MASTER BUILDERS COMPANY

Mr. A. H. Meyer has been appointed advertising manager of the Master Builders Company, manufacturers of concrete hardeners, waterproofings, masonry treatments, and allied technical products for the construction industry. National headquarters are in Cleveland. Mr. Meyer will direct all advertising and sales promotion activities.

### R. C. MAHON COMPANY

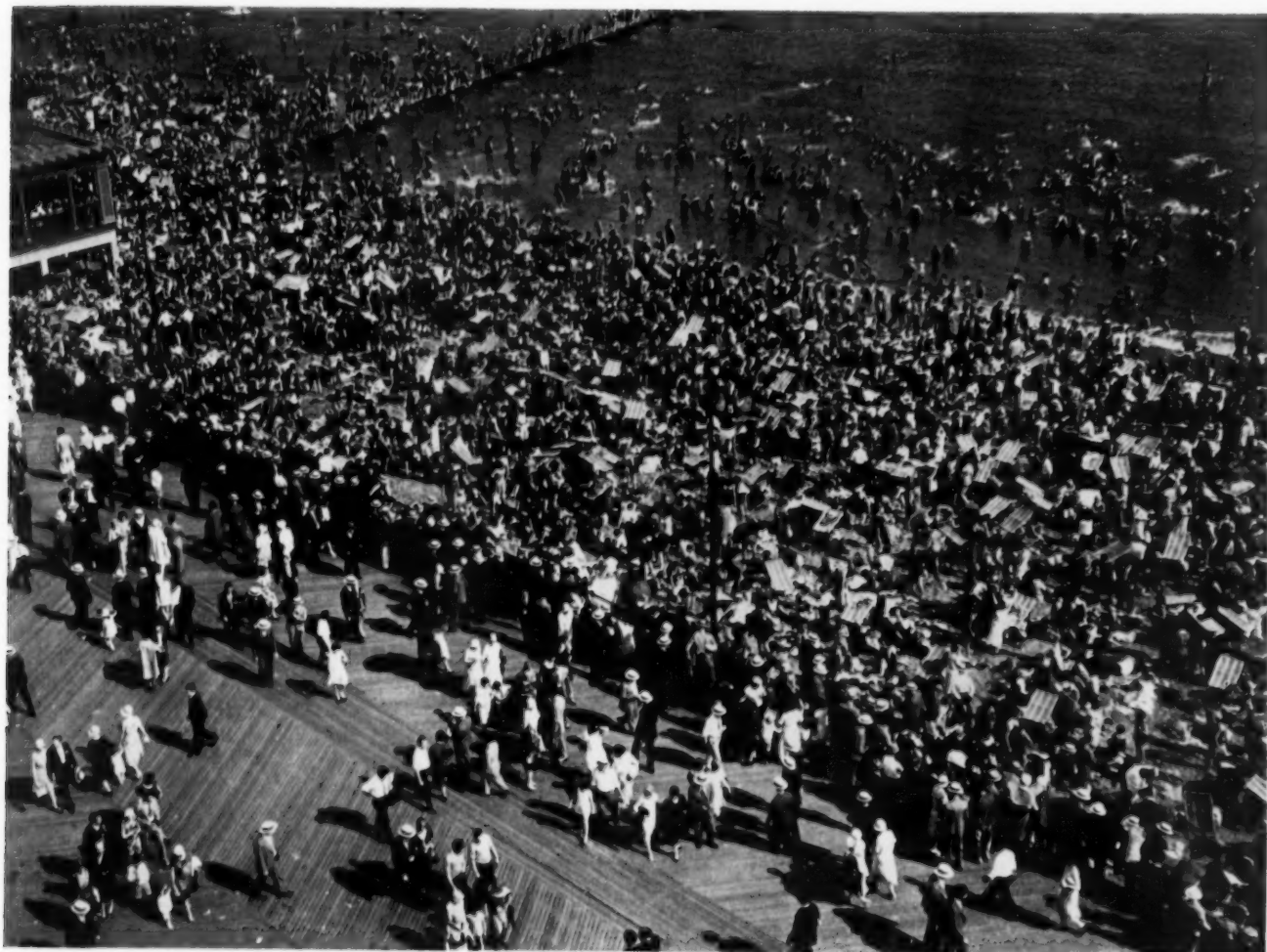
The R. C. Mahon Company, Detroit, Michigan, has established a sales-engineering office in Chicago, Ill., located at 231 So. LaSalle St. This office will be headed by Walter F. Sheetz, Vice-President of the company.

The company is engaged in the manufacture of steel roof deck, acoustical ceilings, permanent floor forms, rolling steel doors and roof sumps; also special industrial equipment including spray booths, blow pipe systems, ovens and ventilating equipment.

### SLOANE-BLABON

Sloane-Blabon Corporation has announced the appointment of Joseph Mandell & Co., of Boston, Mass., as wholesale distributors of Sloane-Blabon Linoleum and Felt-Base.

## SEEKERS OF AIR...



Ewing Galloway

**W**hen perspiring city dwellers leave baking pavements and apartments behind...and swarm on the breeze-swept beach...they pay an eloquent testimonial to the importance of comfortable air in modern life. ¶ For 70 years Sturtevant has striven to make comfortable, healthful air conveniently accessible...and certain...regardless of the whims of the weather or the accident of location. ¶ Today, at the push of a button, you can instantly enjoy the cool of the mountains in August or the balmy warmth of Miami in February ...thanks to Sturtevant research and equipment.

B. F. Sturtevant Co., Hyde Park, Boston, Mass.

**Sturtevant**  
REG. U.S. PAT. OFF.

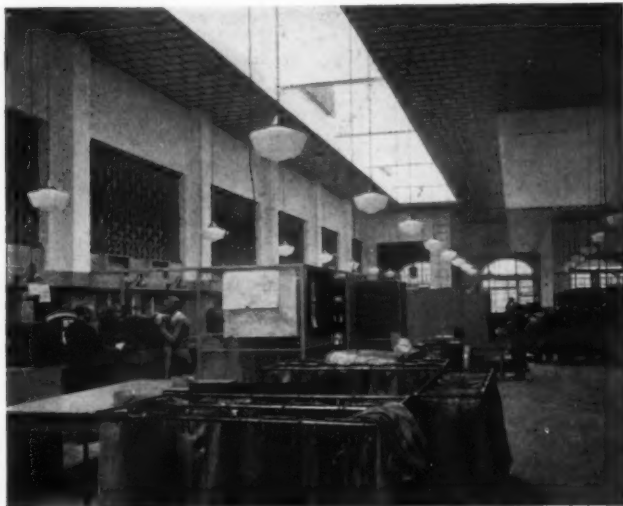


VENTILATING • HEATING • AIR CONDITIONING EQUIPMENT



PAINTABLE PERMANENT  
**ACOUSTI-CELOTEX**  
TRADE MARK REGISTERED U. S. PATENT OFFICE

**controls sound**



Acousti-Celotex is the sound-absorbing material applied to the ceiling of the U. S. Post Office Bldg., Palo Alto, California. Birge M. Clark, architect.

**... Permanently Effective  
Even With Repeated Painting!**

**Y**OU can safely specify Acousti-Celotex. It is suitable for any kind of interior: Offices, restaurants, hotels, hospitals, schools, churches, recreation centers.

Acousti-Celotex unit tiles are easily applied to existing walls and ceilings, or to new interiors. They lend themselves to a variety of attractive patterns. Then, too, you will appreciate its many economies — installation, maintenance, longevity.

You will be interested to note that Acousti-Celotex has a permanent sound-absorbing efficiency, made possible by 441 perforations per square foot. For example:

One square foot of Type Triple B Acousti-Celotex absorbs, at 512 cycles, 91% of the incident sound. Painting the surface does not affect its efficiency, thus providing limitless decorative possibilities. These are some of the practical advantages that make Acousti-Celotex so desirable. Prices are lower. Get special details from the Acousti-Celotex contracting engineer in your city, or write direct.

Ask about Type A, the new half-inch material. It is designed for use where large areas are available, requiring an absorbent material of only moderate efficiency.

THE CELOTEX COMPANY  
919 N. Michigan Ave., Chicago, Ill.  
Please send me general literature on Acousti-Celotex.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

A. R. 6-34



EVANS

"Vanishing

Door"

WARDROBE

Class X

equipped with either "Jamb" type (as illustrated) or "Floor" type hinges. This is Class P wardrobe if made with flush doors.

CLASSROOM WARDROBES

*High in Quality—Low in Cost*

Made to set in a recess flush with the wall. Plaster back, ends and ceiling. No partitions, but with mullions between pairs of doors. Blackboards if required. Five-shelf bookcase instead of clothing equipment at no extra charge when desired.

The "Vanishing Door" hinges on which the doors are hung are made with double pivoted arms and swing the doors back into the wardrobe entirely out of the way. Simple—trouble-proof—and last as long as the building.

Wardrobes are furnished complete in the knock-down, with all woodwork cut to size, and only need to be nailed in place. The hinges are easier to put on than common butt hinges. The entire cost of installation is small.

We make many other types of school wardrobes, fully illustrated and described in 1934 Sweet's, Volume C, pages 656-663.

**W. L. EVANS**

WASHINGTON, INDIANA, U. S. A.

HOLTZER-CABOT EQUIPPED



The new Baltimore City Hospital at Baltimore, Md., embraces the highest standard of modern hospital planning and equipment. All equipment installed in this modern institution passed the most rigid test and had the unanimous approval of the architects and owners.

Holtzer-Cabot Signaling Systems were selected because of their high quality and dependability, and because they are standard equipment in so many hospitals throughout the world.

Holtzer-Cabot engineers have specialized for over sixty years in the design and development of up-to-the-minute signaling apparatus and will gladly assist and advise on any signaling problem.

**THE HOLTZER-CABOT ELECTRIC CO.**

BOSTON

*Offices in all principal cities*

Pioneer Manufacturers of HOSPITAL SIGNALING SYSTEMS

The Architectural Record, June, 1934

# MODERN

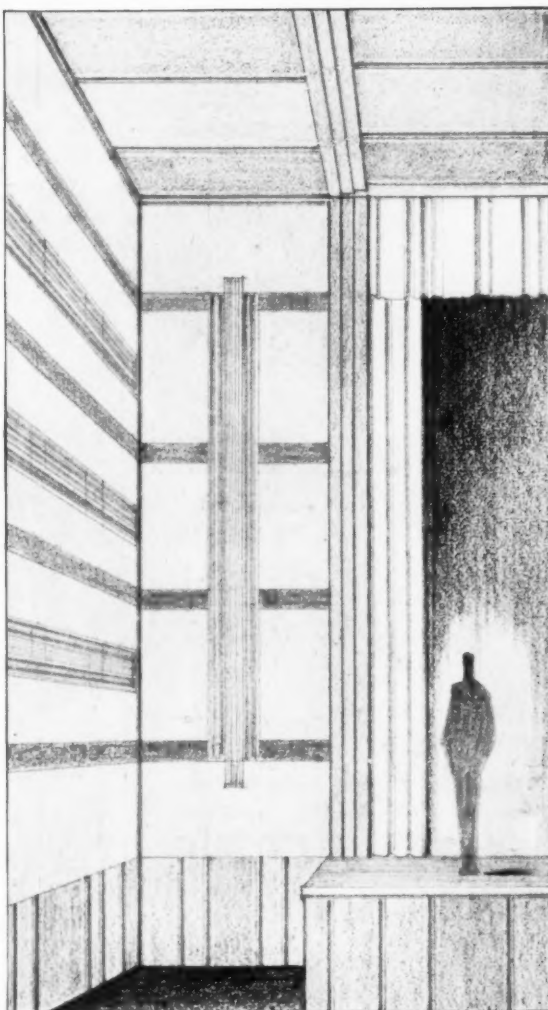
## Because One Material Performs Four Functions

**N**OT so very long ago, an interior such as the one shown on this page would have required at least four separate jobs and a number of different materials.

There would have been lath-and-plaster on the walls and ceiling. There would have been decorating to do. Insulation and acoustical treatment would have added to the expense.

Today, all four of these functions are performed at amazingly low cost by NU-WOOD—the *multiple-purpose* wood fiber material. For NU-WOOD provides a sturdy, lasting surface, covering old walls and ceilings and taking the place of lath and plaster in new construction. It decorates—soft, glowing NU-WOOD colors and endlessly-varied NU-WOOD patterns create distinguished beauty. It insulates, presenting an effective barrier to the passage of heat. And it assures correct acoustics.

For your use, we have prepared a handsome book, containing nearly fifty architects' renderings of NU-WOOD



Combined use of  
NU-WOOD Plank  
and NU-WOOD  
board assures a  
theater auditorium  
of striking beauty,  
correct acoustics,  
efficient insulation  
—all at low cost.

interiors. You will find this book a source of inspiration and a mine of practical suggestions. It is yours for the asking—without any obligation whatever. Just mail the coupon!

### WOOD CONVERSION COMPANY

Room 118, First National Bank Building, St. Paul, Minnesota

WOOD CONVERSION COMPANY  
Room 118, First National Bank Building  
St. Paul, Minnesota

Please send me, without obligation on my part, your book, "New Wall and Ceiling Treatments with Nu-Wood."

Name .....

Address .....

City..... State.....

# NU-WOOD

WOOD CONVERSION COMPANY



Made By The Makers of  
**BALSAM-WOOL**

ST. PAUL • • • MINNESOTA

*Products of Weyerhaeuser*



House in Great Neck, N. Y. Architects, Evans, Moore & Woodbridge, New York City. Painted with Cabot's DOUBLE WHITE and Green Gloss Collopakes.

## It Isn't Paint That's Expensive, It's Painting and Re-painting

Less than one-fifth of the cost of painting pays for the paint. The rest is for putting it on.

"In painter work the most important fact to remember is that the cost of applying paint is from four to five times the cost of the paint itself, — and therefore to use materials of poor quality because of their relative cheapness, is false economy." — *Encyclopedia Britannica*, 1928 edition

Paint materials of high quality mean repainting less often, with resulting large savings to your client.

It is well known that Cabot's Collopakes stand up long after cheaper paints have gone to pieces. Even if Collopakes did cost much more than cheaper paints, it would still be economy to use them. Cabot's DOUBLE-WHITE, Old Virginia White, Gloss Collopakes, Stucco and Brick Stains, and Interior Flats all cost your client far less in the end.

The coupon below will bring you full information

# Cabot's Collopakes

FOR EVERY PAINT USE

Made by the Makers of Cabot's Creosote Shingle and Wood Stains

*Samuel Cabot*  
Inc.  
Manufacturing Chemists



SAMUEL CABOT, INC.  
141 MILK STREET  
Boston, Massachusetts

Gentlemen: Please send me Color Card and information on Cabot's Collopakes.

Name .....

Address .....

AR-6-34



Design Patent No. 89,865

## Distinctive Grilles of Patented Design

Hendrick specializes in distinctive grilles—many of them covered by design patents. Typical of these special Hendrick Grilles is Design Patent No. 89,865 . . . a pleasing pattern . . . 57% open area.

Perforators of metals for more than fifty years, Hendrick is well equipped to furnish perforated metal grilles of all types and patterns, in steel, aluminum, bronze, stainless steel, brass.

An inquiry, or a request for the Hendrick handbook, "Grilles" will receive prompt attention.

## HENDRICK MFG. CO.

19 Dundaff Street, Carbondale, Pa.

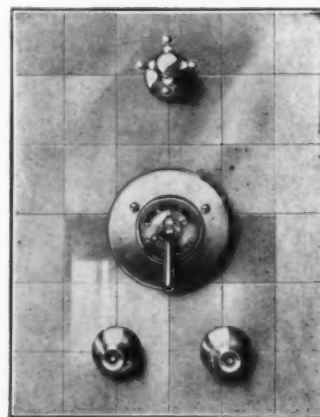
Offices and Representatives in principal cities. See 'phone book Mrs. of Mitco Open Steel Flooring, Mitco Shur-Site Treads, and Mitco Armorgrids, Hendrick Perforated Metals and Screens.

MIXING

LEONARD

VALVES

THERMOSTATIC



A NEW LINE of Leonard Valves for every type of house is now available. The new series of Leonard Mixing Valves for Shower, Tub, and other Hot Water outlets, are low in cost—also upkeep—and are simple and rugged in construction for both exposed and concealed piping. Capacity range from 5 to 15 gallons of water per minute. They are small and will fit into any 3" partition. All replacements are made from the front.

Literature giving full installation dimensions will be sent upon request.

IN SWEET'S CATALOGUES

Manufactured by

LEONARD-ROOKE CO.

INCORPORATED

Providence, Rhode Island



# NOW YOU CAN SPECIFY STYLE AND BEAUTY AS WELL AS EFFICIENCY...



## THE NEW DE LUXE MODEL IDEAL REDFLASH BOILER

●  
THOROUGHLY INSULATED. The handsome jacket of the De Luxe Redflash not only adds to its beauty but to its efficiency as well. It insulates the boiler so well that children can play around it without danger of burns.

●  
SEE THE INSIDE. Open the outer door of the De Luxe Redflash and see the scientific design and sturdy construction that have made the Redflash line famous. Beauty outside, efficiency inside—that's the story!

WHAT lovely fixtures do for the bathroom... what colorful equipment does for the kitchen... the new De Luxe Redflash Boiler does for the basement. Here at last is a boiler for solid fuel that is really handsome. You will welcome the opportunity it offers to design a distinctive game room, play room or den in the basement without the need for a separate boiler room. You will approve its modern design. And your client, because he knows the name and the dependability behind this handsome boiler, will approve your specification. Write today for all the details.



## AMERICAN RADIATOR COMPANY

40 West 40th Street, New York, N. Y.

Division of AMERICAN RADIATOR & STANDARD SANITARY CORPORATION



1906

# MODERN CATALOGING

Published Monthly by SWEET'S CATALOG SERVICE  
Division of F. W. Dodge Corporation



1934

Volume 1

JUNE, 1934

Number 1

## BULLETIN BOARD

*Many fine catalogues  
lack one vital thing—  
CONSTANT  
ACCESSIBILITY*

*Wellbilt, Inc., Gets Out  
a New Catalog*

Printer to Advertising Manager—  
"Pretty swell, eh?"

Advertising Manager to Sales Manager—  
"Pretty swell, eh?"

Sales Manager to Sales Force—"Pretty  
swell, eh?"

Salesman to Architect—"Pretty swell,  
eh?"

Architect (a week later)—"Wherein-  
hell is that Wellbilt catalog? It was a  
swell looking thing . . . etc."

"Speedier relief for distressed home owners, increased credit for new home building and repair, wider employment in the building trades, and strong Federal protection for private savings are some of the concrete benefits anticipated from the amendment to the Home Owners' Loan Act."—*John H. Fahey*, Chairman of the Federal Home Loan Bank Board.

*Millions and Billions for Buildings* may be one of America's claims to fame, but in India there is a residence which is also on speaking terms with big money. This palace cost the maharajah \$50,000,000—yes, fifty millions. Among its countless devices for comfort and pleasure are musical instruments attached to over 3,000 windows which respond with melody to the drafts or breezes.

Architects aren't the only people who get more direct mail advertising than they know what to do with. We recently read of a hotel which once received 827 separate pieces of direct mail in twenty-four hours.

## If You Want It—You Can Have It

**H**OW WOULD YOU LIKE to have a catalog file to which you could turn at any time with the utmost assurance that you could find instantly complete information on any reputable building product?

"That's just too good to be true," said an architect to whom we addressed the question. "It would take a library staff to make such a file and a squad of mounted police to keep it that way."

So it would, if each architect had to do the job for himself. But Sweet's has already done a good part of it for the entire profession. And with the assistance (practical, as well as moral) of the whole body of architects, Sweet's will carry it through to completion. The benefits will be shared alike by architects and by manufacturers.

*Many architects are aiding materially in the development of what they themselves term "their file" by recommending to manufacturers, at every opportunity, that they file their catalogs in Sweet's. Many others try, as often as possible, to tell manufacturers whose catalogs in Sweet's they have consulted, of the source of their information. This is practical assistance indeed.*

## FIRE!

**H**AVE YOU READ Paul W. Kearney's article, "Modern Fire Control," on page 495 of this issue of the RECORD? Don't miss it. A knowledge of how fires act, and why, is the first requisite for fighting them effectively at the drawing board. The next is "fire-conscious" design and its concomitants, selection and use of suitable materials and also of adequate detecting and protecting equipment.

The careful study of available products which must precede intelligent selection and specification will be greatly facilitated by consultation of manufacturers' catalogs in the Sweet's file. Here in one place, the architect will find detailed information and technical data on many fire-resistant materials and on fire-detecting and fire-protection equipment.

*"We find nothing to compare with Sweet's for convenience and completeness and would like to see all reputable manufacturers place complete catalogs in Sweet's."*

E. W. MAYBURY,  
MARSTON & MAYBURY,  
PASADENA, CALIF.

## Behind the Scenes

**O**BVIOUSLY, catalogs must do much more than merely advertise the products they describe. Their function is to present all essential facts—organized and complete information.

While it may be assumed that manufacturers of building products have the desire to produce catalogs which will give architects the kind of information they need, it is nevertheless true that some lack the personnel and experience required for this highly specialized work. Sweet's Consulting Service places at the disposal of Sweet's clients a staff of consultants whose extended experience in the building construction field and intimate knowledge of methods and procedure in architects' offices enables and qualifies them to give expert advice on the most effective form of catalog presentation.

Sweet's Consulting Staff has already started work on catalogs for the 1935 Sweet's file. It is anticipated that the constantly growing demand for their services will result in a more comprehensive and complete file of manufacturers' catalogs.

## Catalog Files—Old Style and New



**N**O ARCHITECT needs to be reminded of the time, effort and expense required to maintain even a semblance of a workable file in the days before there was any alternative to building one up, piece by piece, from the catalogs supplied at irregular intervals by the manufacturers. The sorting, classifying, filing, refiling and replacement of individually distributed catalogs necessitated a time-consuming routine which few had the facilities or inclination to follow. The result was highly unsatisfactory both to architects and to manufacturers.

It was hardly surprising that architects welcomed the inauguration of a new method of catalog distribution which would give them, instead of the raw materials for a file, a complete file in itself. In spite of its modest beginning, the plan was received favorably by the entire profession. At once, it became the custom for architects to "look it up" first in Sweet's—and to resort to the old file only when forced to do so. In the following years, the Sweet's file grew to such proportions that many found it unnecessary to maintain any other, especially in view of the marked trend toward the distribution of complete catalogs exclusively in Sweet's.

Note: This and the other related subjects are discussed more fully in Sweet's Catalog File, 1934, Section A, page 104.

*"We have almost entirely eliminated our general file of catalogs and are relying on Sweet's for our catalog information. This has been a considerable saving to us and we find it much more satisfactory."*

D. FOLSUM,  
FOLSUM & STANTON,  
Philadelphia, Pa.

## Sweet's Consulting Staff

THE members of Sweet's Consulting Staff personally prepared or directed the preparation of many of the most complete and informative catalogs filed in Sweet's.



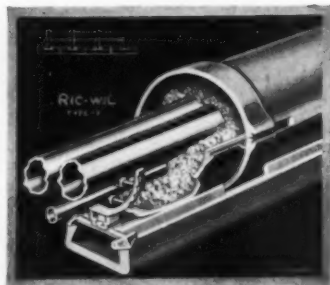
ABRAM BASTOW, A.I.A.; registered architect in New York and New Jersey; member Architectural League of New York; educated Pennsylvania Academy of the Fine Arts, Beaux Arts Institute of Design, University of Pennsylvania, School of Architecture 1910; instructor in architectural construction Cooper Institute 3 years; associated in Philadelphia with W. C. Hays, John T. Windrin, Cope & Stewardson and in New York with H. Van Buren Magonigle, Ludlow & Peabody and Charles Butler; private practice since 1918; member of firm of Latenser, Bastow & Way; consulting architect for Sweet's Catalogue Service since 1919.

## As We Were . . .



**AIR CONDITIONING—1906.** How admirably—in this illustration which appeared in the first edition of Sweet's twenty-eight years ago—has the artist caught the atmosphere (indicated by the little arrows) of a big operator's office of the day. "The ventilator," reads the out-spoken copy, "not only purifies the air, but prevents colds, pneumonia, etc."





**For underground  
steam lines:**

A completely engineered conduit system  
Delivers 90%+ efficiency  
All parts interlocking  
Asbestos Dry-paC insulation  
Variable types of construction and materials to  
meet all conditions  
Typical drawings and specifications on request

See our Catalog in Sweet's

THE RIC-WIL CO., 1562 Union Trust Bldg., Cleveland  
Agents in principal cities

REGISTERED IN U. S. PATENT OFFICE  
**RICWIL**  
CONDUIT SYSTEMS FOR  
UNDERGROUND STEAM PIPES

## MODERNIZE with a CUTLER MAIL CHUTE



Expected as a matter  
of course in the mod-  
ern office building or  
apartment.

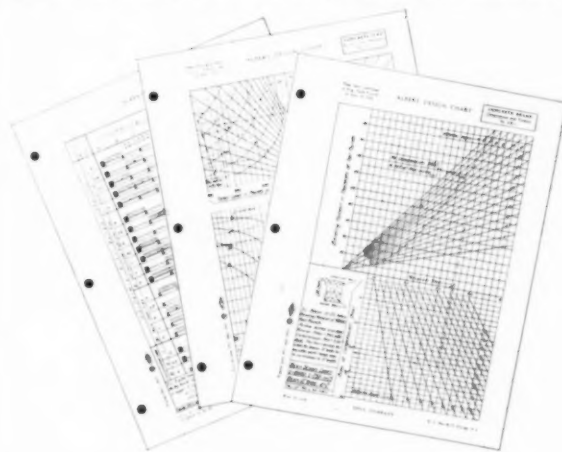
It guarantees to the ten-  
ant up-to-date service  
and saves the owner  
its cost in reduced  
elevator operation.

Full information, details, specifications  
and estimates on request.

**CUTLER MAIL CHUTE CO.**

General Offices and Factory  
ROCHESTER, N.Y.

## REINFORCED CONCRETE DESIGN



## Use These Inexpensive Design Charts to Save Time and Insure Accuracy

THE ALBERT DESIGN CHARTS graphically present the theories, formulas and computations involved in reinforced concrete design.

There are ten charts on beam design, four on column design, one on slab design, five on continuous beams, four on various theories, "The Fixed Point Theory," etc., etc.

The charts on *continuous beams* are most complete. Values are given for different kinds of loading, both uniform load and one, two, or three concentrated loads, applied on all the spans or applied in such a way as to produce maximum, positive and negative moments. The ends are either free or restrained, or free one side and restrained the other.

The chart on *flat slab* gives at once the thickness for various loadings, moment coefficients and stresses, and in addition the reinforcement required.

Other charts give tension and compression steel for various concrete stresses and values of "n".

The *column design* charts are also very complete, treating columns with centric loading for different values of the concrete stress and value of "n", as well as columns subject to compression and bending.

Each chart is a complete unit, with an example showing how to use it. All charts are finely printed on 8½ x 11 heavy ledger paper, punched for standard ring binder.

**Complete Set 24 Charts  
Only \$2.40**

**MAIL THE COUPON TODAY**

**The Architectural Record**

AR 6-34

Enclosed find \$2.40 for which send me a set of the 24 ALBERT DESIGN CHARTS.

Name.....

Address.....

City and State.....



# What a Break

**THIS WOULD HAVE BEEN  
FOR BRUNELLESCHI!**

● What would the Great Ones of the age of stone have done with modern concrete? What might have been the course of architecture had the Brunelleschis, the Michelangelos, the Mansarts, or the Wrens been able to work with modern concrete . . . with a material that liberates design rather than restricts it?



★ The City Hall at Pasadena, California—an instance of the way in which concrete lends itself to the execution of traditional styles. Architects: Bakewell & Brown. Contractors: Orndorff Construction Co.



★ No other material is so ideally suited to modern design. Here is a facade, executed entirely in monolithic concrete, on the Edmond Meany Hotel in Seattle, Washington. Architect: R. C. Reamer. Contractors: Teufel & Carlson.

It is an interesting conjecture . . . particularly as we advance further and further into the Age of Concrete. In Europe, today, and in America many designers are throwing off the shackles of old materials to work in concrete: a material capable of the widest latitude in the composition of masses . . . of infinite variety in surface textures . . . and of color.

Here, for instance, are notable examples of concrete's adaptability to varied architectural classes: one, the traditional Spanish . . . the other, the modern.

**PORTLAND CEMENT ASSOCIATION**

**ROOM 276 • 33 WEST GRAND AVENUE • CHICAGO, ILLINOIS**

## What the Modern Home Owner Demands—

He is "convenience and comfort minded"—among other things he is demanding "front porch coolness" in his sleeping rooms, even on the very hottest and most sultry summer nights.

That is the kind of convenience and comfort the Dexter Heat Valve offers—it is the modern, trouble-free, and maintenance-free method of lowering building interior temperatures.

It will be to the advantage of every architect to secure complete information on this economical and efficient device. Write

**THE SWARTWOUT COMPANY**  
18613 Euclid Avenue Cleveland, Ohio



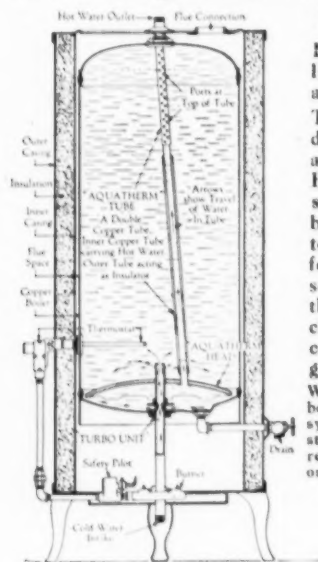
for  
lowering interior temperatures  
of homes, apartment houses,  
office buildings, hospitals, in-  
stitutions, schools, garages,  
etc., and many industrial appli-  
cations specify the

**DEXTER  
HEAT VALVE**  
THE SWARTWOUT CO.  
EXCLUSIVE LICENSEE  
UNDER PATENT NOS. 2,100, 2,101 AND OTHERS PENDING

## DAHLQUIST "Turbo Unit"

Keeps hot water clean

The only fundamental improvement made in hot water storage tanks during the past 40 years.



**TURBO AQUATHERM**  
(Under fired automatic hot water storage system)

**Saves Gas—Stops Burnouts**  
Prevents sediment from accumulating and keeps hot water clean and fresh.

This latest invention by Theodore W. Dahlquist is supplied in all DAHLQUIST COPPER BOILERS and absolutely stops sediment from forming on the bottom of the boiler. No need to drain a Dahlquist boiler every few weeks. The TURBO prevents sediment from forming—keeps the hot water always crystal clear, fit for drinking—prevents costly burnouts—reduces cost of gas 50%.

Whether your need is for a home range boiler, an automatic hot water storage system or a commercial heavy pressure storage boiler, learn more about this remarkable improvement before you order.

Write for descriptive catalog.



2000 B.A.L. BOILER

All types of copper boilers

**DAHLQUIST MFG. COMPANY**

— West 3rd Street.

So. Boston, Mass.

We Will Pay 25 Cents Each and Postage Charges for These Numbers of THE ARCHITECTURAL RECORD if Sent Before July 15th, 1934:

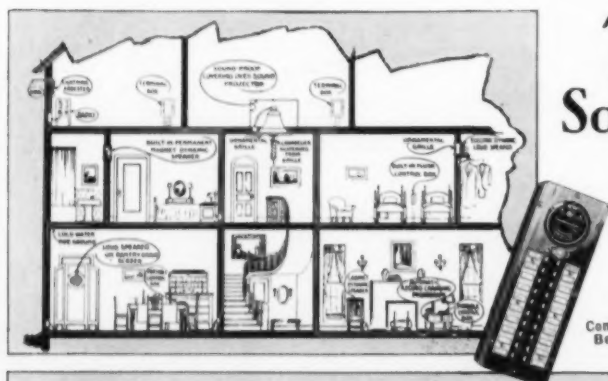
OCTOBER, 1933

JANUARY, 1934

FEBRUARY, 1934

MARCH, 1934

THE ARCHITECTURAL RECORD  
119 West 40th Street  
New York, N. Y.



## TE-LEK-TOR *Remotely-Controlled* Sound Systems for Residences

HIGH quality reproduction of radio and phonograph programs is made available throughout the residence with TE-LEK-TOR control of the distant instruments. Outlet plates available for standard one to four gang switch boxes. Write for the TE-LEK-TOR Booklet describing the acoustic effects and convenience a TE-LEK-TOR System makes available.

STROMBERG-CARLSON TELEPHONE MFG. CO.  
ROCHESTER, N. Y.

**THERE IS NOTHING FINER THAN A STROMBERG-CARLSON**



*Resists*  
**CORROSION**  
**YEARS**  
**LONGER**



**OVER 300 DOORS**  
*made from* **SUPERIOR**  
**GALVANNEALED...**



THE STAMP OF QUALITY ON  
EACH SHEET

When the beautiful Shrine Mosque was built in Atlanta, Georgia, Dowman-Dozier Manufacturing Company furnished over 300 Fire Doors made from SUPERIOR GALVANNEALED Steel Sheets. These doors do more than insure against fire hazards—they will resist corrosion and the etched and mat-like surface, that *takes and retains* the finish, permitted the doors to be decorated in highly ornamental fashion with lavish Moorish finish and designs.

Door Bucks, Fire Doors, Humidification and Ventilating Systems, Toilet Partitions, Portable Shower Baths, and many other types of sheet metal work are among the uses where SUPERIOR GALVANNEALED is the preferred material.

We shall be glad to mail you a standard sample with proof of past performance, and detailed information on which to base your own recommendations for the use of SUPERIOR GALVANNEALED Sheets.

**SUPERIOR**  
**COATED SHEETS**

**THE SUPERIOR  
SHEET STEEL CO.**

CANTON, OHIO

DIVISION OF CONTINENTAL  
STEEL CORPORATION



Manufacturers of Black, Single Pickled, Galvanized, Long-Ternes, Super-Metal, Galvannealed, "Konik" and "Copperior" steel sheets.

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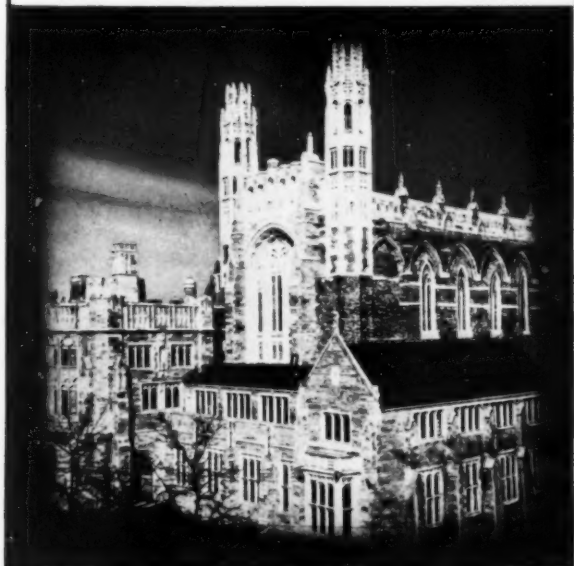
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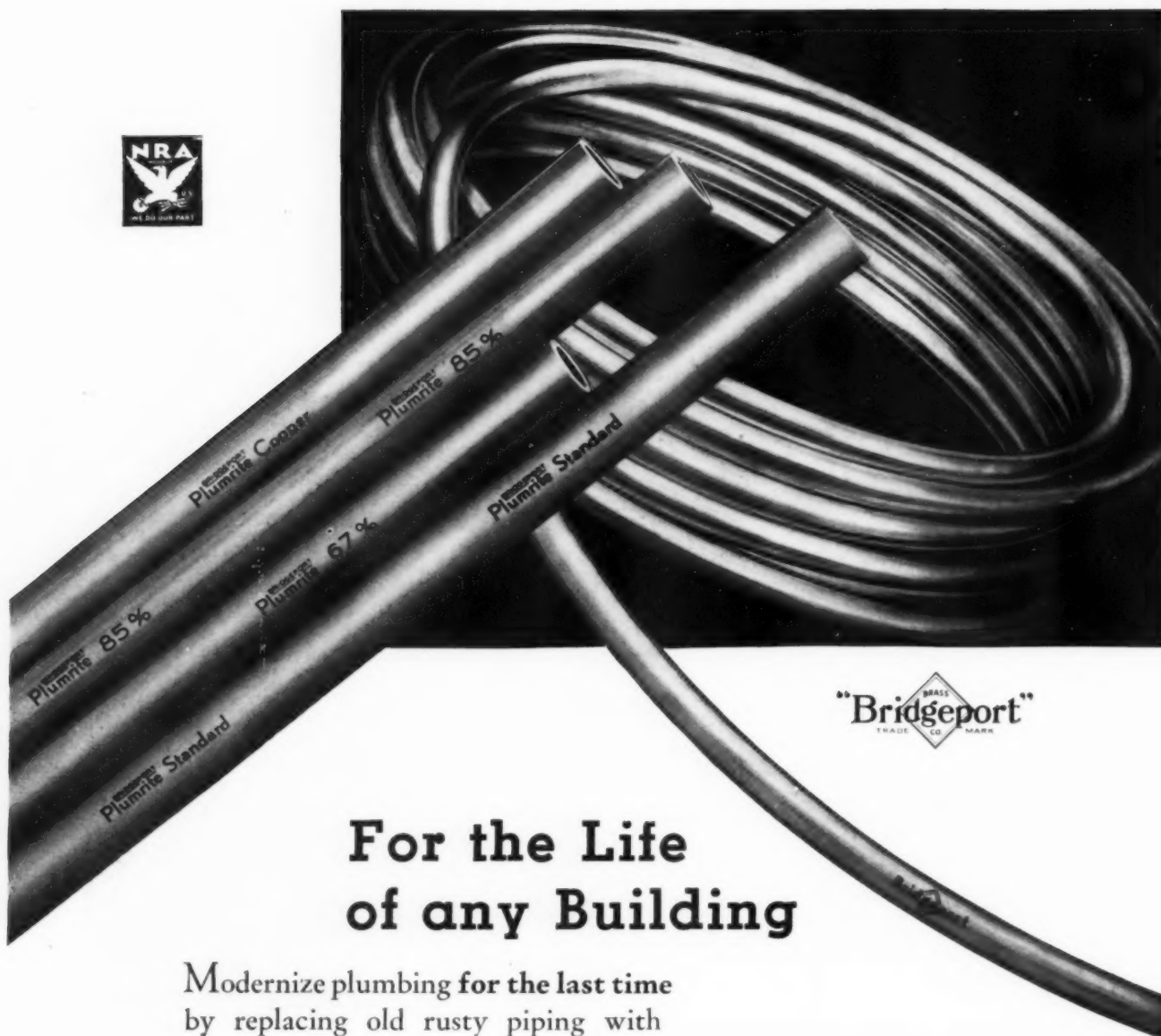
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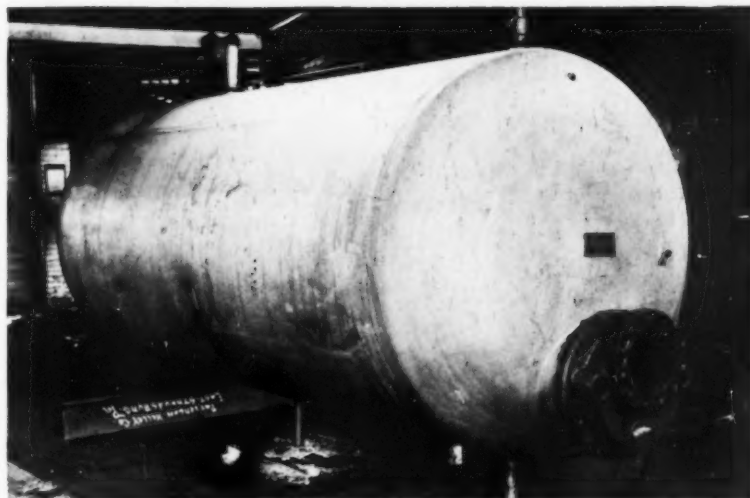
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